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UNITED SERVICE INSTITUTION OF INDIA

for

the furtherance of interest and knowledge in the art, science and literature of the Defence Services

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JULY-SEPTEMBER 1973

NOTE

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FINANCIAL MANAGEMENT IN DEFENCE SERVICES

D. S. NAKRA*

I PROPOSE to indicate first that what is practised today in the form of budgetary and financial controls is not real financial management; I shall then proceed to state what the scope and content of financial management should be, making special reference to new budgetary concepts and inventory control, and finally I will suggest reorientation of the organisational relationships between the Services and the Ministries of Defence and Finance.

Financial management has three aspects—(1) constitutional or formal, (2) executive and (3) functional or professional. The first covers regulatory and budgetary controls, the second direct executive action and the third the techniques of accounting, costing, budgeting, etc. The regulatory and budgetary aspects are commonly understood to mean financial management but it is really the second aspect which is important, as it is co-extensive with total management. Accounting and costing are rightly treated as professional services.

The emphasis on the first aspect was natural under the British rule because under a foreign power mainly concerned with the one function of maintenance of law and order and the exploitation of the natural resources of the country, there were no development plans to be executed and no self-reliant defence services to be built up and therefore the question of management, financial or otherwise, as distinct from administration, did not arise. Unfortunately, we have not restructured our administrative and executive systems to meet the exacting demands of a developing country. Our financial management still comprises observance of sets of obsolete rules and regulations oriented more to out-dated canons of propriety than to principles of cost-effective executive action. We have heavy volumes of such financial and administrative rules and regulations; we have time-consuming and expensive procedures by which we are baulked at every step. Our rules consist mainly of checks and cross-checks by different agencies. We protest and complain but do nothing about them. In fact we have idolised a class of persons who are supposed to be experts

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in the interpretation and application of these rules. Our commanders tell us that our training grant rules hamper rather than help training. Our T.A. rules are a labyrinth of numerous provisions covering all possible types of movements—instead of a simple basic provision for actual cost of travel by the entitled class plus graded rates of reasonable out-of-pocket expenses. Our accounts and audit department comes in for uncharitable criticism because they have to ensure the observance of these rules. A good part of our financial control at Government level consists of rechecking of calculations such as those of works estimates, accommodation statements, stores indents, etc. Another part is examination of a large number of individual cases. This is not financial management and in so far as the services at the highest level accept this system, with or without protest, they themselves must accept the responsibility for the present state of affairs. We have to reframe rules and regulations to meet present-day requirements. The Services Chiefs must insist on the rationalisation of these rules if they wish their officers to do full justice to their main job of keeping themselves and their men trained and fit for the defence of the country.

WOOD MISSED FOR TREES

One could possibly tolerate the nuisance aspect of mere regulatory financial control if it did not do any positive harm; unfortunately this type of control misses the wood for the trees. While calculations and rates are being checked and rechecked some major components of plans and projects are lost sight of, and cost and time estimates go wrong. Here are some figures that speak for themselves.

	Original estimates	*Revised estimates*
Project A	Rs. 32 crores	Rs. 47 crores
B	Rs. 8 crores	Rs. 13 crores
C	Rs. 52 crores	Rs. 102 crores
D	Rs. 96 crores	Rs. 150 crores

The cost of delays is staggering and very often involves large expenditure of foreign exchange.

For example, a project was sanctioned at a cost of Rs. 14 crores with a foreign exchange content of Rs. 8.5 crores to avoid future imports, yet imports worth Rs. 10.75 crores had to be made and the economic viability of the project was destroyed. In another case of the same type the investment was Rs. 37.7 crores with a foreign exchange content of Rs. 14 crores and yet imports worth Rs. 36 crores had also to be made. In

still another case a project was sanctioned at a cost of Rs. 70 crores to set up facilities to produce a particular ammunition. Except for a part of the facilities, sophisticated special-purpose machines were ordered; naturally it took time to get these machines manufactured and installed. Before the factory could reach even 40% of its capacity, there was urgent need for that ammunition in large quantities and in a short time. It was then discovered that the ammunition could be produced in any numbers by reliable engineering units by general engineering methods. If financial management had been project-oriented and not merely calculation-checking, a good part of the expenditure and that too in foreign exchange could have been saved and put to other use.

Any number of examples of this type can be given to show that mere regulatory control is not financial management.

The other part of formal financial management is budgetary control.

Under Article 112 of our Constitution, all Government expenditure except a relatively minor part has to be authorised by Parliament. For this purpose, a statement of estimated receipts and expenditure—the Annual Budget, is placed before both Houses of Parliament. Government expenditure is broadly classified into (a) expenditure on revenue and (b) expenditure on capital account. The expenditure on revenue account covers the maintenance of administration and services and the expenditure on capital account creates tangible assets or extinguishes recurring liabilities—it is investmental or developmental in nature.

The revenue expenditure is generally met from the proceeds of taxation whereas capital expenditure is met either from borrowings or from cash balances. With the increasing tempo of expenditure in all spheres of Governmental activities, capital funds, i.e. loans, have often been utilised to meet revenue expenditure with the intention of repaying them from revenue account over a number of years.

For budgetary purposes, each Ministry of the Government of India is allotted separate Demand Heads for capital and revenue expenditure. Demands for Grants are voted by Parliament in the form of an Appropriation Act. If the appropriations made are found to be inadequate, supplementary demands are presented and voted; within certain limits re-appropriations are also allowed to be made.

The implications of parliamentary control are :

(a) the vote of Parliament sets a limit to the expenditure that may be incurred;

(b) the expenditure can be incurred only for the purpose for which it has been voted; and

(c) the vote of Parliament is for the gross expenditure. In other words, the sanctioned grant cannot be exceeded except with the approval of Parliament; no expenditure can be incurred on a service not provided for in the Annual Budget and any excess receipts cannot be appropriated towards additional expenditure.

Parliamentary control has also to ensure that the funds are utilised for the purpose for which they are voted and the objectives are in fact achieved. This performance appraisal is entrusted to Parliamentary Committees, two most important of these being the Estimates Committee and the Public Accounts Committee.

The P.A.C. examines the expenditure on the basis of the appropriation account prepared by Financial Adviser, Defence Services and the audit report of the Comptroller and Auditor-General.

In order that Parliamentary control may be meaningful, departmental budgetary control is exercised by the executive Ministries concerned, the heads of Department and the Finance Ministry.

The Defence Budget is structured under five major heads, to cover expenditure on the Army, Navy and Air Force and expenditure on pensions; the fifth head accommodates capital expenditure.

THREE CATEGORIES

The process of preparation of budget estimates is that the Services Headquarters concerned prepare the estimates which normally fall under three categories: Standing charges, (pay and allowances, etc.); maintenance requirements (stores and equipment); and new measures. These estimates are examined by the DFA concerned in the Ministry of Finance (Defence). After this examination, they are sent to the DFA (Budget) who makes a broad and critical examination with reference to general policies and parameters. He consolidates the Budget Estimates and puts them up for approval by FA (DS) and the Defence Secretary. A budget paper is then prepared for the Political Affairs Committee of the Cabinet and the budget, as finalised by the P.A.C. is sent to the Budget Division of the Ministry of Finance for submission to Parliament for approval.

Budget estimates are revised from time to time. The first review takes place in September and is called Preliminary Report. The second review is done in December and is called Preliminary Revised Estimates

and the final review takes place in January to produce the Revised Estimates for the year. At almost the close of the financial year, a modified Appropriation is prepared on the basis of 11 months' actuals.

The budgetary system is all right for the formal control of Parliament; it conceals more than it reveals. Security considerations would not permit presentation of the Defence Budget in a materially different form but from the point of view of financial management it is really ineffective. Budgetary provisions do not give any indication of the scope of services or projects and programmes. The budget is more a statistical projection than an instrument of management. Compiled figures and actuals do not make it possible for any rational assessment of performance. For example, works expenditure excludes establishment cost, stores expenditure does not include inventory ordering and inventory carrying cost. If budgetary provisions and progress of expenditure have to be linked with performance, budgeting will have to become programme-oriented and it is here that Planning, Programming and Budgeting System (PPBS) which I will discuss presently, will help to link the Defence Budget with different programmes of which the progress and success will be watched by the executives and audit with reference to the programme provisions.

As it is, neither the Defence Ministry nor the Finance Ministry nor even the Service Headquarters themselves have adequate means of financial and executive control today.

If this is the position, how can we make financial management meaningful and effective ?

In very broad terms, management consists of "planning, organising, motivating and controlling" and ensuring successful execution. In other words, management is directing, supervising, regulating and evaluating performance. Financial management covers all these activities. But financial management is not just translation of physical plans or targets into monetary terms. It examines the economic viability of investments in financial, strategic or social terms. It makes an assessment of human and material capabilities to achieve the physical plans, it often reviews and resets these targets, it relates these targets to availability of resources which it has to generate and regulate. It assesses how far project estimates are realistic and reasonable; it ensures best possible contractual deals, participates in and contributes towards evaluation of policies and plans specially in regard to production, purchases, personnel, etc.

I call this aspect of financial management "macro financial manage-

ment", in contrast to budgeting, accounting, cost-accounting, etc. which may be called micro financial management.

It is in the context of this totality of management that I propose to deal with the subject.

The objective of the Defence Services is optimum defence preparedness at the most economic cost; it is making the most cost-effective use of available resources.

The prerequisite of financial management is a clear statement of the parameters of defence preparedness; a definition of the type or types of threat which the Services will be called upon to meet—this definition may have to be adjusted from time to time as geo-political factors change, but the objective must never be allowed to deteriorate into just the maintenance of the Services at certain numerical levels with whatever equipment we can buy or produce.

OVERALL PLAN

Next comes the translation of the objective into a need-based overall Defence Plan by the Service Chiefs collectively and individually for each Service covering inter-alia re-equipment and modernisation plans and indicating the cost and time parameters as well as the relative inter-se priorities of the various components of these plans.

If the requisite funds cannot be made available, the Defence Plan may have to be pruned and projects of lower priority dropped or modified, but then we will know clearly what risks, if any, we are taking. Alternatively, if the risks are such as cannot be taken the nation may have to make other sacrifices.

The technique followed so far has been to make a statistical projection of Defence expenditure and to try to accommodate Defence needs within this financial framework. This in my view is not the right approach, it may be financial arm-twisting but it is certainly not financial management. This technique does not lead to the building up of team-spirit and good human relations. It creates an atmosphere of uncertainty and leads to executive frustration. Besides it is also more costly in the long run. Unrealistic and impracticable compromises and half measures are accepted under this procedure and more often than not the expenditure proves infructuous as it fails to achieve the objective. I remember a case when an essential requirement of the Army would have cost about Rs 80 crores with a foreign exchange component of about 50%. Instead a compromise

was attempted at a cost of Rs 20 crores with a foreign exchange content of Rs 12 crores to be completed in two phases. Before even the first phase was completed, an emergency exposed its unsoundness and it was dropped, and sanction was then given for a much larger amount with a much higher foreign exchange component.

What is worse is that while low-priority measures continue to be sanctioned, high-cost high priority schemes of re-equipment and modernisation keep on being postponed till a critical situation is reached when the Services can return the compliment and do administrative arm-twisting. Sanctions are then rushed through; large-scale imports which could have been avoided to a considerable extent are made at exorbitant take-it-or-leave-it prices and that too without adequate regard to quality. The new equipment is inducted into service without sufficient training and practice. Similar is the position in regard to indigenous production and procurement. Many crores are sanctioned and spent when much less would have met the requirements more adequately and in time if Defence needs had been realistically considered and met earlier at the cost of some of low-priority items if necessary.

So financial management must begin at the top and move downwards. It is like the mythological tree which has its roots at the top and its branches below. These branches of financial management are the techniques and mechanics of building up Defence projects, ensuring integration and co-ordination of various programmes and the usual budgetary, cost and inventary controls.

Before I deal with these matters let me dispel the impression prevalent in certain quarters that in Defence matters financial considerations are of secondary importance because the nation must anyhow find all the funds necessary for national security. Outside the Defence Services, the States, the Government Departments and even the public enterprises often do not wish to pay for services and expect the Defence Budget to absorb the cost; at the same time they demand and get away with exorbitant payments for services and supplies inflating the Defence Budget unnecessarily. Within the Services this concept is interpreted to mean that what is demanded is also what is essential. This approach is as much detrimental to the practice of sound management as the denial or inadequate allocation of funds for approved Defence Plans.

Sound financial management must make a clear distinction between the desirable and the essential and learn to sacrifice the former so long as funds are scarce. The Defence Budget has gone up from Rs 280 crores to Rs 1600 crores in 10 years and further increases can be rather marginal.

We have, therefore, to manage the available funds more effectively; that is financial management. But it is not a one-time job which is completed when a plan is approved, it is a continuous process of adjusting our policies and requirements to changing circumstances and advancing technologies. This is a difficult process which has to be performed within the cost and time-frames of the approved plan by internal adjustment because the scope for flexibility becomes limited after the Defence Plan has been integrated with the national Plan.

SURPLUS STORES

One way of managing within limited funds is to cut out dead and the dying wood, and cut it out quickly. We are carrying surplus stores of the value of Rs. 400/-crores or more. At the rate of only 10%, their carrying cost is Rs 40 crores p.a.—a tidy sum which can be used for essential requirements. Besides, there is a heavy lot of obsolete and obsolescent equipment which has not yet been formally sentenced. Apart from involving carrying cost, these holdings stand in the way of re-equipment, and modernisation programmes : the old equipment continues to be provisioned and thus less and less funds become available for new equipment. For example the spares for a certain equipment continued to be provisioned till it was finally decided to discard it. The book value of discarded spares was Rs. 100 crores. In another case a complex of factories has been built at a cost of about fifty crores to produce an equipment; but even before the assembly line has been brought into full production, there is talk of replacing the equipment. This is no management—financial or otherwise; good management demands total coordinated, integrated and comprehensive planning and timely executive action. If our experience tells us that the type of war we are likely to face will involve short but fast action, and if we must therefore plan to acquire light mechanical bridges that can quickly span rivers, if we must have ready-made easily transportable light metalic landing mats, if we should have more aeroplanes to drop paratroopers, if we should have armoured personnel-carriers, if we have to have self-propelled heavy guns and if we have to introduce missiles, then we must review and eliminate or reduce the requirements of protective materials for trenches, assault boats, tractors etc. We must not only project what is needed in the future but also cut out or reduce what is not required or is required in reduced quantities and numbers. Otherwise, we will go on collecting more and more of deadwood and have less and less of funds for really effective weapons and equipment.

Again in the light of our experience of war and the industrial and technological progress in the country, we must review the scales and the

scope of our reserves which were fixed on the basis of

(a) World War experience and

(b) the long pipeline of imports

As far as I know these reserves have been seen to be excessive in many cases; reduction in scales is called for; in any case a review should be undertaken. In fact it is necessary to review scales and norms of all types—the cost of equipment is so heavy that our training, R&D and other such requirements must be given a second look. Recently we had to import a very costly weapon and the usual members were demanded for training, R&D and inspection purposes; but when it was pointed out that by reducing the number of weapons, more ammunition could be provisioned with the available funds, the latter course of action was adopted. What was done as a special case deserves to be considered for general application.

REFORMED PROCEDURES

When we have attended to these basic issues of management we have practically controlled our inventories. What will remain to be done is to revamp and reform our procedures. Instead of checking and re-checking indents, we should pay more attention to the review and revision of maximum and minimum stock levels with reference to future needs as distinct from provisioning deficiencies so that obsolescence can be weeded out in time and cases of large surplus and write off of huge amounts and of creation of unwanted production capacity do not arise or are at least minimised. We should introduce an ordering system based on ABC analysis so that high and medium value items receive more attention—generally about 20% of the total stock items account for about 80% of the usage value of the inventory. By concentrating on these items and by careful determination and periodical review of qualitative requirements and stocking levels management can save much more than by the so-called economy measures and elaborate checks and cross-checks which have more psychological and formal than financial significance. The point to be borne in mind is that what we save becomes available to us for expenditure on more essential requirements within the parameters of the Defence Plan.

An idea of the savings that can result from better inventory control can be had from the following:

The value of inventories in the Defence public sector is Rs. 220 crores. DGOF's inventory is of the order of Rs. 100 crores. Of the value of the inventory of the three Services, we do not have even a

rough estimate because no priced accounts are kept—it may be of the order of Rs. 1,000 crores. The normal commercial estimate of inventory carrying cost is about 22% of book value made up of

Storage, inspection, transportation, depreciation	—	3.5%
Accounting stock verification	—	1.3%
Depreciation in storage	—	2.5%
Obsolescence	—	5%
Interest on capital	—	9%
Insurance	—	0.2%
		21.5%

Excluding the last two items, although strictly speaking, the interest on capital should not be excluded, the inventory carrying cost on Defence would amount to 12%, even @ 10% the inventory carrying cost in Defence would be Rs. 132 crores p.a. (Rs. 22+ Rs.10+100 crores). We have our difficulties in so far as war reserves have to be maintained and critical spares and raw materials specially of foreign supply have to be stocked but still a reduction of 25% should not be impossible. The saving or rather the funds available for more fruitful expenditure would be of the order of Rs. 30 crores per annum. It has already been shown that getting rid of surpluses and obsolete stocks alone can save Rs. 40 crores p.a.

Some of the other important questions that good financial management has to ask are :

(i) Do we have to plan our factories with a high reserve machine capacity even today when firstly the capital expenditure involved is very heavy and secondly when with technology advancing faster than the weapon or epuipment for which the reserve capacity is kept the latter may itself become obsolescent soon ?

(ii) Do we have to plan the squadron requirements of aircraft on rather low serviceability basis even when the cost of aircraft is in terms of crores and not in lakhs?

(iii) Is short colour service still desirable when the cost of training on sophisticated equipment and weapon systems is rising every day and when it is becoming more and more costly to lose trained men at or near their optimum level of efficiency?

(iv) Do we still need our own engineering and medical colleges and our own farms?

(v) Does the NCC serve any useful purpose to justify an annual expenditure of Rs. 20 crores?

(vi) Can we still justify scales of land requirements which give a population density for military population of less than 4 per acre?

(vii) Can we find some means of encouraging private capital to build residential accommodation for us?

If this is what financial management means, then it is clearly seen to be primarily an executive function and not merely a system of regulatory controls nor a set of specialised techniques to be applied by experts. It involves :—

(a) The evolution of a time-bound and need-based plan to achieve a clearly defined objective;

(b) adjustment of the Plan within the allocated funds by means of fixation of inter-se priorities and review and revision of scales quantitative and qualitative and norms of requirements.

(c) Linking of modernisation plans with programmes of cutting out obsolete and obsolescent equipment and quick disposal of the latter.

It is more easily said than done. Within these broad parameters a lot more has to be done. Planning does not mean just a statement of statistically projected conceptual parameters, it has to be imaginative and yet precise. It has to be programme-oriented. This means the full-fledged adoption of Planning, Programming and Budgeting System—P.P.B.S. for short. Under this system, a programme memorandum is prepared by the head of each department in respect of each activity of programme for which he is responsible. The alternatives considered and the decisions taken are indicated in the Memorandum. The reasons in support of the decision are also given.

MULTI-YEAR PROGRAMME

On the basis of the programme memoranda, a comprehensive multi-year programme and financial plan are prepared presenting in a tabular form a complete summary of the programme in terms of their outputs and costs. The multi-year programme and financial plan initially contain items recommended by the Departmental heads but later include only those finally approved by Government. This multi-year programme and Financial Plan is updated periodically. The policy decisions on which the programmes are based are supported by special studies which provide the analytical background.

The programme structure is so designed as to permit a self-contained analysis of cost effectiveness of alternatives. The components of the programme structure do not necessarily correspond to appropriation heads or to organisational structure.

The implications of P.P.B.S. are very important; long-term proposals have to be worked out in detail. I have already shown how cost and time estimates have gone wrong; we have to ensure realistic estimates with reference to :—

(a) check lists of items of estimates,

(b) feedback information regarding completion costs,

(c) cost trends.

It is only in the light of realistic time and cost estimates that expenditure can be regulated and controlled. Revenue expenditure is incurred on men and materials in anticipation of completion of projects and if there is delay, manpower is not properly utilised, professional skills do not develop to the optimum as men get used to expensive and ineffective patterns of manning and considerable funds are locked up in heavy inventories.

To avoid all this cost/time estimates have to be realistic and execution expeditious. For this purpose, the techniques of Pert or C.P.M. have to be employed to ensure timely and successful implementation of programmes, cost benefit analyses have to be made to select the most effective and economical alternative. Operational Research becomes an integral part of management. Accounting has to be reoriented to produce management accountancy data, internal audit has to change its primary role from that of a critic to one of a helpful friend and guide, presenting a constructively critical review of performance.

To do this successfully intensive practical training of selected staff will be necessary. Besides the organisational patterns at Service Headquarters and at the lower formations will need reorientation, it will perhaps be necessary to give the overall responsibility to one of the PSOs at each Service Headquarters; the Ministries of Defence and Finance will also have to make some adjustments in their organisations.

Reorientation of organisational relationship is desirable and necessary from another point of view also—the need for an efficient system of performance evaluation and feed back information. Audit reports and appropriation accounts including reviews of MES, Ordnance Factories etc. do not constitute performance evaluation, they highlight failures and shortfalls and do not give an overall picture of programmes and the extent of achievement.

The present organisational relationship between the Services and Finance came into existence in 1906 when the Military Department of the Government of India was abolished and the Military Accounts Department was transferred to the Finance Department. The Government Resolution read as follows:—

"With the object of making financial control over military expenditure more constant and efficacious;....to facilitate this, the Military Finance Secretary and his establishment will be located in the same office building as the Army Department and the said Secretary wlll be in constant personal communication with His Excellency the Commander-in-Chief and the Honourable Member for Military Supply, who will thus be able, whenever that is sought desirable, to take his advice on the financial aspect of any military question before making a formal reference to the Department through its Military Finance Branch. He will also be a member of any Consultative Commitee which may be formed to consider matters relating to Army Administration. At the same time, he will be in no way subordinate to the Military authorities, but will be responsible only to the Honourable Financial Member and to His Excellency the Governor General."

This arrangement was expected to "obviate any friction or misunderstanding which might arise were the Branch of the Finance Department charged with the carrying out of this duty not in close touch with the Military authorities."

BASIC CONCEPT

From what I have quoted, it will be clear that the basic concept of the Organisation was functional integration combined with professional or departmental independence.

For all practical purposes the organisational pattern of Military Finance or Ministry of Finance (Defence) as it is now called, has remained intact since 1906.

Very significant developments have taken place since this Orgnaisa- was evolved. These are:

(i) Evolution of the Ministry of Defence since Independence.

This means that direct contact between the Services and Defence Finance is constitutionally abolished although in actual practice it is still in evidence to some extent.

(ii) Expansion of Services Headquarters.

The large-scale expansion of the Armed Forces of India and of the Defence Ministry

(iii) Expansion of Production Organisation and the Defence Public Sector

The DGOFs organisational budget (Revenue & Capital) has increased from about 35 crores in 1961 to about 200 crores. The number of factories has increased from 19 to 30, the value of production has touched Rs. 170 crores.

Eight public sector undertakings are now operating in the Defence Sector, their production has reached Rs. 200 crores per annum and is expected to increase further.

(iv) Expansion of R&D

This organisation has 32 establishments under it with a budget of over Rs 24 crores which is expected to increase eightfold during the next 10 years.

These developments require fundamental changes in the organisation and functioning of Defence Finance and Defence Accounts and incidentally in the Defence Ministry too.

In 1906 Military Finance was expected to operate as an organisation integrated with the Army Department although it was independent of it constitutionally. I can say from personal experience that this objective was fully achieved. Although there was a Ministry of Defence, it was not co-extensive with the Services Headquarters. Most cases used to originate from Service Headquarters and were processed with Military Finance. When agreement was reached, Services Headquarters used to issue orders "with the concurrence of financial authorities" and they had the force of Government orders. Formal Government orders, where necessary, often used to issue later. The Ministry of Defence used to come into the picture only when really important policy issues were involved. I still remember an important case in which orders were issued by A. H. Q. with the concurrence of financial authorities and the then Defence Secretary, Sir Charles Oglieve, took serious exception to it because the decision affected an important aspect of the policy of the Government of India. To the best of my recollection, he sent a written note to Army Headquarters to say that financial concurrence by Ministry of Finance (Defence) meant only that the Ministry of Finance did not have any objection to the expenditure being incurred but it did not mean the approval of the Government of India from the policy angle which must be cleared with the Ministry of Defence in important cases. It shows the extent to which Services Headquarters and Ministry of Finance had achieved coordination and integration.

Things are different today. By tradition and habit good relations have prevailed between Services Headquarters and Defence Finance and a good deal of active liaison and mutual understanding exist. This is also partly due to the fact that Defence Finance is manned, to an appreciable extent, by officers of the Defence Accounts Department who have a life-long association with the Services. But strictly speaking, the Ministry of Defence solidly intervenes between Services Headquarters and Defence Finance. I remember that many years ago when as Aditional Financial Adviser, I settled an important matter relating to the pay scales of Army Officers in an informal discussion with the then Chief of Army Staff and the A.G., I was given a good piece of mind by the then Defence Minister who maintained, and quite rightly too, that the settlement should have been with the Ministry of Defence.

The constitutional position being what it is, it is inevitable that things will move further in this direction. When three large organisations have to deal with a case, instead of two compact ones, there will be delay. And it is a fact, the experience of all of us, that Government machinery is heavily clogged today.

POLICY ISSUES

What is worse than the loss of speed is the loss of the sense of proportion. As somebody said we are so much concerned with the urgent that we lose sight of the important. The Defence Ministry must divest itself of matters of detailed implementation of policy and concentrate on broad policy issues, otherwise it will be merely duplicating the Services Headquarters by gradual expansion losing itself in the jungle of details. It is an important fact that both Services Headquarters and Ministry of Defence (and consequently Defence Finance also) are trying to regulate and direct in minute detail multi-crore projects; they are not only sanctioning capital works, but laying down the designs and specifications also; not only determining the policies regarding weapons and equipment, they are also involved in provisioning action; again they are not only concerned with improvements in the structure of emoluments etc. but are also dealing with a very large number of individual cases. As FADS at one moment I was asked to look into a project costing say Rs 300 crores and next to decide a case relating to the admissibility of an individual claim of a few thousands or even a few hundred rupees.

The result is that the more important a policy matter is and consequently the more time and thought that it needs, the less attention actually it receives; it is being constantly pushed out of the way till more time

can be found for it and unfortunately this ampleness of time is seldom available.

The new pattern of relations will have to be based on:—

(i) Large-scale delegation of powers to the Services within the parameters of approved 5-Year Plans;

(ii) Simplification of rules and regulations;

(iii) Making the Controllers of Defence Accounts ex-officio Financial Advisers to the Commands in the field of delegated powers—like their counter-parts in the Railways, and entrusting them with the task of constructive performance evaluation of major projects and schemes—the Ministries of Defence and Finance cannot move down into the field but the officers of the Defence Accounts Department, move up on deputation and personal equations established as a result of close association in financial management will lead to happier relations and quicker decisions at the higher levels.

CONCLUSION

To sum up, the points I have made are that formal and regulatory controls have their value and importance but effective financial management means clear and precise formulation of long-terms plans and objectives, expeditious execution and evaluation of performance. Secondly, it implies a regular periodic review of the means of achieving the objectives i.e. our procedures and systems and streamlining them and introducing more modern techniques. Thirdly it requires a vigilant questioning of time-honoured scales and norms and practices both in quantitative and qualitative terms to adjust them to changed conditions so that dead and dying wood does not prevent us from making the most economical and cost-effective use of our limited resources. All this implies that financial management is primarily an executive and not a specialised professional function.

As regards organisational relationships, I have suggested a reorientation to bring about a close association with officers of the Defence Accounts Department to pave the way for happier relations and speedier discussions at Government level.

THE ROLE OF NATIONAL INTEREST IN PAKISTAN'S FOREIGN POLICY

M. S. DAHIYA

REPLYING to a question in the House of Commons, Winston Churchill once said: "England has no permanent friend and no permanent enemy, but permanent interest." The same is applicable to every country and Pakistan is no exception. Prime Minister Liaqat Ali Khan's declaration before the American Congress in 1950 that Islam and Communism cannot co-exist did not hold good,[1] when Pakistan realised the necessity of cementing its relations with the People's Republic of China in the 60s, and started to receive both economic and military assistance from China as well as the Soviet Union, in the face of its vertically growing friendship with the Western powers.

There is no doubt that ideological considerations play quite an important role in the foreign policy of Muslim countries but when national interest and ideology coincide, the former prevails. Had ideology been so important a factor, Afghanistan would not have voted against Pakistan's entry into the United Nations and Egypt would not have adopted a neutral attitude towards the Kashmir problem.[2] In contrast to other Muslim countries, a comparative study indicates that ideological considerations were completely relegated to the secondary place, if not ignored by the Pakistani leaders. As a matter of fact, the foreign policy makers used ideology as an instrument for the furtherance of their national interest[3]. President Bhutto surpassed his predecessors in the sense that he visited the Soviet Union at a time when the Russian support to India during the Bangladesh liberation struggle was being resented in the streets of Islamabad.[4] Most of the experts on Soviet and Pakistani affairs have ignored Bhutto's visit to the Soviet Union at that time, but it is pertinent to note

1. See George J. Lerski, "The Pakistan-American Alliance: A Revaluation of the Past Decade", *Asian Survey* (California), vol. VIII, No. 5, May 1968, p. 401.
2. Werner Levi, "Pakistan, The Soviet Union and China", *Pacific Affairs*, vol. XXXV, No. 3, Fall 1962, p. 212.
3. During the Indo-Pak war of 1965, the then President of Pakistan was reported to have stated that the war was not being fought between India and Pakistan but India and Islam.
4. See Sheldon W. Simon, "The Kashmir Dispute in Sino-Soviet Perspective", *Asian Survey*, vol. VIII, No.3, March 1967, p. 178.

that it was the beginning of neutralizing the USSR in Indo-Pak affairs, as President Ayub Khan's visits in 1965 and 1967 did successfully.

Born and nurtured in a communal atmosphere, combined with a fear of India, it was natural on the part of Pakistan to seek allies who could stand by her, at least for the protection of her territorial integrity and political independence. But the attitude adopted by the major powers towards the Indian subcontinent made the problem quite difficult. The Soviet Union did not formulate her policy in regard to the newly independent countries in South Asia till 1955,[5] the Labour Government in England was not prepared to annoy Nehru on the Kashmir issue[6] and Washington was interested in cementing its relations with New Delhi, in preferenoe to Pakistan, for the very purpose of containing Communism through the mechanism of military bases around the periphery of the Soviet Union.[7] Washington's stand became clear when, in 1949, President Truman invited Nehru to visit the U.S.A. In view of this state of affairs, the Pakistani leaders "invited" an invitation from the Soviet Union. But the Pakistani Prime Minister dropped his projected visit, when the American Secretary of State for Middle East and African Affairs personally extended the U.S. Government's invitation to Liaqat Ali Khan in 1950, thinking that the friendship of the Soviet Union might undermine the interests of Pakistan.[8] On the other hand, Pakistan recognized the newly created State of Red China,[9] in clear disregard to the wishes of her would-be allies in various alliances. Subsequent developments clearly show had America invited Prime Minister Liaqat Ali Khan in 1949, instead of Nehru, perhaps Pakistan would not have recognized the existence of Red

5. See Mirzo Tursham-Zade, "Beyond the Hills of Pakistan", *Current Digest of Soviet Press* (Hereinafter referred to as *C.D.S.P.*), vol. II, No. 6, March 25, 1950, p, 29 (From *Literaturnaya Gazeta*, February 4, 1950).

6. Even at the Commonwealth Prime Ministers' Conference of May 1949 "it had been agreed that India could remain in the Commonwealth as a republic." It appeared to Karachi "as an attempt on the part of Britain to humour and placate India", Vijay Sen Budhraj, "The Evolut on of Russia's Pakistan Policy", *The Australian Journal of Politics and History*, vol: XVI, No. 3, December 1970. p. 346.

7. In spite of India's criticism of American policy, Washington gave preferential treatment to India in economic aid. See M.S. Venkataramani, and H.C. Arya, "America's Military Alliance with Pakistan—The Evolution and Course of an Uneasy Partnerhip", *International Studies* (New Delhi), vol. 8, July 1966—April 1967, p. 82.

8. According to a Pakistani Group Study, "Pakistan had noticed the subservience which was forced upon the allies of the Soviet Union and, as we have seen, independence had been won after too profound a struggle for its loss to be risked. Furthermore, there was the question whether Russia could supply the aid, both material and technical which Pakistan so urgently required. For these reasons, an alliance between the two countries was, *ab initio*, impossible." "Fundamentals of Pakistan's Foreign Policy". (A Group Study), *Pakistan Horizon*, vol. IX, No. 1, March 1956, p. 46.

9. See *The Dawn* (Karachi), January 5, 1950.

China so early.[10] Furthermore, Nehru's attachment to the policy of non-alignment played quite an important role in throwing Pakistan into the orbit of America. Had Nehru showed a somewhat sympathetic attitude towards America's policy of containing communism, Washington would not have invited the Pakistani Prime Minister in 1950, nor would he have dropped his visit to the Soviet Union. Setting aside every thing, at that time Pakistan was inclined to build herself against India. As such, it was a question of material help[11] and not dry friendship of any major power.

Since the United States had assured Pakistan her vigorous support on the Kashmir issue,[12] the Pakistani leaders were bound to make some friendly gestures,[13] irrespective of the Soviet annoyance.[14] But when the Soviet Union sided with India in December 1955 on the Kashmir issue,[15] the Pakistani leaders extended their hand of friendship to that country also. So far as China was concerned, in spite of the fact that the military alliances of which Pakistan was a member were directed against both China and the Soviet Union, Prime Minister Mohammed Ali Bogra assured the Chinese Prime Minister Chou-En-lai at the Bandung Conference in 1955 that Pakistan's membership was designed against India and as such China should not take it as any reflection on Karachi's attitude towards her position.[16] More than that, in May 1956, an agreement was signed with

10. After entering into an alliance with America, Pakistan voted with the Western powers up to 1962 in regard to China's admission to the United Nations. But When America did not seem to support her wholeheartedly, she began to support China for the very purpose of getting her sympathy in her struggle against India. Moreover, Pakistan ceased to take interest in the military alliances and lost her faith in their utility. When it seemed that SEATO might demand contribution of troops to protect Thailand in the summer of 1962, Pakistan made it clear in anticipation that "no contribution would come from her", as "all her troops were needed in Kashmir", Werner Levi, n. 2, p. 221.

11. Just before the partition of India, Feroz Khan Noon, a prominent member of the Muslim League who later became Prime Minister of Pakistan, said: "if the Hindus give us Pakistan and freedom then the Hindus are our best friends. If the British give it to us then the British are our best friends, but if neither will give it to us then Russia is our best friend." *Ibid.*, p. 212.

12. See "Anglo-American Rivalry in Pakistan" *C.D.S.P.*, vol. IX, No. 25, August 2, 1950, pp. 10-11. (From *Pravda*, June 19, 1952, p.3.)

13. See Prime Minister Liaqat Ali Khan's comment in "Liaqat Ali Khan shows Servile Zeal", *New Times*, No. 3, 1950, p. 20.

14. Pakistani Prime Minister's statements to support the American action in Korea annoyed the Soviet leaders so much that they kept the ambassadorial post vacant in Karachi up to March 15, 1950. See Vijay Sen Budhraj, "The Evolution of Russia's Pakistan Policy", *The Australian Journal of Politics and History*, vol. XVI, No. 3, December 1970, p, 347. Besides they warned: "The assistance Liaqat Ali Khan is capable of rendering the American aggressors in Korea, is, of course, a negligible quantity. But the Pakistan Premier's readiness to serve American imperialism may have very important and deplorable consequences for Pakistan." See No. 13.

15. In June 1956, Pakistan entered into an agreement with the Soviet Union and accelerated the process of maintaining some sort of relations. See Vijay Sen Budhraj, n. 14. p. 353.

16. For details see this author's "Sino-Pak Relations—A Probe into the Past Decades", *United Asia*, May-June 1973.

the People's Republic of China, according to which Pakistan was to receive a substantial amount of coal from Peking.[17]

Despite the fact that Pakistan had adopted a pro-West policy by entering into alliances, she was inclined to please both China and the Soviet Union, for the simple reason that they were sympathetic to India in the mid-50s. To achieve this aim, Suhrawardy visited China in 1956 and the successor Prime Minister accepted the Soviet invitation to visit Moscow in 1957. But in view of the strained relations between New Delhi and Washington he went to America, in the hope of securing Washington's vigorous support on the Kashmir issue. But Pakistan had to meet rough weather in the sense that the resolution sponsored by Great Britain and America in 1957 in the Security Council was vetoed by the Soviet Union.[18]

Besides, when Ayub Khan captured power in October 1958, it was expected in certain circles that in view of his pro-West views, the foreign policy of Pakistan was bound to be the same.[19] It was to some extent corroborated by a bilateral military agreement between the United States and Pakistan, and the U-2 incident in 1960 gave it new impetus. But the assumption of the American Presidency by John F. Kennedy[20], an old friend of India, made the Pakistani leaders to realize the urgency of cultivating other major powers.[21] As such, Pakistan began to look towards both China and the Soviet Union. Surprisingly, even after initiating a proposal of joint control of the subcontinent by India and Pakistan in 1959, which was rejected by Nehru, Pakistan was bent upon appeasing China. Its importance remains in the fact that Ayub's proposal was directed against China. So far as the Soviet Union was concerned, even after the Soviet veto in favour of India in 1962, in the Security Council over the Kashmir issue, Pakistani leaders soft-pedalled the Soviet moves. In this connection, it is

17. M. A. Chaudhury "Pakistan and the Soviet Bloc", *Pakistan Horizon*, vol. IX, No. 2, June 1956, p. 79.

18. While defending her stand, the Soviet representative called the resolution insulting to the people of Kashmir, *The Hindustan Times*, New Delhi, February 21, 1957.

19. For a detailed study see an interesting analysis by Colonel Mohammed Ahmed *My Chief* (Lahore), First Published, 1960, pp. 73-74, and M. S. Dahiya, "Soviet Pakistani Relations since 1950", *U.S.I. Journal* October-December 1972.

20. Before assuming the American Presidency in 1960, Kennedy had gone on record to urge the United States to extend unqualified support to India. See Khalid Bin Sayeed, Pakistan's Foreign Policy : An Analysis of Pakistani Fears and Interests", *Asian Survey*, vol. IV, No. 3, March 1964, p. 753; Ajit Bhattacharjea "Nehru's Third Journey to America", *The Hindustan Times* (New Delhi), November 4, 1961: Zubeida Hasan, "Western Arms Aid to India", *Pakistan Horizon*, vol. XVI, No. 4, Fourth Quarter, 1963, p. 333 and D.R. Mankekar, "Late President Kennedy's Interest in India", *The Indian Express* (New Delhi), November 27, 1963.

21. M.A.H. Ispahani, a former Ambassador of Pakistan to America, in 1961 advised the Pakistani leaders to maintain cordial relations with the Soviet bloc. See his article entitled "Blow Zephyr Blow", in *The Dawn* (Karachi) cited in "The Foreign Policy of Pakistan", *Pakistani Horizon* vol. XVII, No. 3, Third Quarter, 1914, p. 245.

pertinent to note that the veto was used by the Soviet Union at a time when the Pakistani Foreign Minister had made it clear that Pakistan's membership of military alliances was in no way an obstacle in the way of friendly relations between Rawalpindi and the Soviet bloc.[22]

The drive for protecting Pakistan's interests by the cultivation of friendly relations with both China and the Soviet Union reached its climax, when in clear disregard of the wishes of its old allies (America, Great Britain and other Western powers), Pakistan signed a number of agreements with both the Soviet Union[23] and China[24] in the 60s. The US State Department considered the civil aviation agreement an "unfortunate breach of the free world solidarity" and postponed the extension of a loan of $ 4.3 million for further improvements and the extension of the Dacca airport.[25]

Above all, President Ayub Khan declared in London in 1964 that should there be any confrontation between Red China and the United States over North Vietnam, Pakistan despite her obligations under SEATO, would not get herself involved. Surprisingly enough, Pakistan began to build friendly relations with Sukarno's Indonesia and Ho Chi Minh's North Vietnam.[26] By the summer of 1964, a pro-West policy had been converted into a dynamic neutrality in favour of the Soviet bloc.[27]

The drive for friendship reached its peak when, in April 1965, Ayub Khan visited the Soviet Union and met Kosygin in a village 25 miles from Moscow. He left an indelible impression on the Soviet leader by saying that Pakistan's entire strategy was designed against India.[28] Under these circumstances, "Moscow concluded with a joint communique containing a formula on national liberation movements so ambiguous enough to be applicable to Kashmir and, indeed, was so interpreted by Karachi media".[29]

22. See M.S. Dahiya, n. 19.

23. Between 1963 and 1965 Russia and Pakistan signed a number of agreements establishing Moscow-Karachi air service, an agreement for exchange of news and teleprinter services with Tass and a cultural agreement. Vijay Sen Budhraj, n. 14. p. 357.

24. Pakistan signed a trade agreement with China in January 1963. Another agreement was concluded in the sensitive field of civil aviation, under which Pakistani planes were accorded landing facilities in Canton and Shanghai in lieu of her permission for Chinese jets to utilise American-built Dacca airport. George J. Lerski, n. 1. pp. 410-11.

25. *Pakistan Horizon*, vol. XVI, No. 3, Third Quarter, 1963, p. 296.

26. George J. Lerski, n. 1, pp. 410-11.

27. The attitude adopted by Pakistan led the Soviet Union in 1964 unlike 1957 and 1962 to observe neutrality in the Security Council over the Kashmir issue. See *The Hindustan Times* (New Delhi), July 18, 1968.

28. See Ayub Khan, *Friends Not Masters : A Political Autobiography* (Karachi, Cambridge University Press, 1967). p. 170.

29. The communique stated that both sides declared "resolute support of the peoples waging a struggle for national liberation and independence and of peoples fighting for the right to decide their future at their own discretion." Sheldon W. Simon, "The Kashmir Dispute in Sino-Soviet Perspective", *Asian Survey*, vol. VII, No. 3, March 1967, p.178.

As this move was favourable to Pakistan, the government in Rawalpindi refused to support the U.S. policy in Vietnam to humour and placate the Soviet leaders. Besides, with the passage of time, Pakistan ceased to take interest in the military pacts and recalled her representative from the SEATO Military Advisers Group[30]. Whereas an apparently pro-West policy in the early 50s was adopted to build herself both economically and militarily against India, the anti-West policy in 1965 was dictated by the fear of India and the American attitude towards the subcontinent. Pakistan's control over Gilgit in Pakistani-occupied Kashmir—'a key point of Sino-Soviet strategic manoeuvring'—and Russia's determination to wean Pakistan away from China gave a better bargaining position to her.

The horizontal relationship between Pakistan and the Soviet Union were converted into a vertically growing friendship, when Ayub Khan again visited Moscow in September 1967. He is said to have declared that there was need for immediate cessation of the war in Vietnam in acknowledgement of the right of the Vietnamese people to decide their fate for themselves without outside interference as envisaged in the Geneva Agreement of 1954. He also expressed similar views on the Arab-Israel conflict. Here he was closer to the Russian line of thought than to that of the American. Moreover, the people in Pakistan began to realize that "participation in the aggressive SEATO and CENTO blocs" had done Pakistan no benefit and that "these blocs were tools of U.S. aggressive policy—the aim of which is to divert Pakistan" from her independent way of development and "to embroil it in military gambles."[31] Pakistan went a step further, when, on the eve of Kosygin's visit to Rawalpindi in April 1968, she gave notice to Washington for the termination of the lease of the American Communication Unit at Budaber near Peshawar, thus depriving the United States of the few remaining strategic benefits she derived from her military alliance with Pakistan.[32] This made the Soviet Union happy and as such in July 1968 she agreed to sell arms to Pakistan on the same terms on which she was selling to India. On the other hand, a pro-Pakistan wave had begun in the United States which culminated into good relations between Rawalpindi and Washington under the Nixon Administration.[33] So far as China was concerned, Pakistan had already developed relations with her. It may be called the real success of Pakistan's foreign

30. Pyadyshev, "New Developments in Pakistan", *International Affairs* (Moscow), June 1968, p. 78.
31. S. Alexandrov, "Pakistan : Twenty Years of Independence", *International Affairs* (Moscow), September 1967, p. 87.
32. Zubeida Hasan, "Indo-Soviet Relations in the 1960s". *The World Today*, vol. 25, no 1, January, 1969 p. 29.
33. In May 1968 the United States declared its intention to supply tanks to Pakistan through Turkey. *The Times*, London, May 13, 1968.

policy in the sense that all the super powers, in clear disregard to India's wishes, began to arm Pakistan. Even a cursory glance over the developments of the past decades makes it clear that the interest of Pakistan from the early 50s found practical shape in the late 60s. Had Pakistan not played the role of a mediator between China and the United States in arranging Dr. Henry Kissinger's visit to China, neither the Soviet Union would have actively supported India in the Indo-Pak War of 1971 nor would disintegration of Pakistan have taken place.

THE MILITARY MIND

MAJOR GENERAL SOM DUTT (Retd.)

"WAR is too serious a matter to be left to the Generals", is a remark which reflects, among other things, the disbelief that the civilian has of the thinking capacity of the military mind. More importantly, it is this attitude which militates against amicability in civil-military relationships. The attitude springs from the assumption that the professional soldier has a mind which, at best, displays a rigidity of approach, is intolerant, dogmatic, authoritarian, and is opposed to democratic ideas. These attributes, it is further argued, stem from a lack of imagination, and a comparatively low level of intelligence. In short, what the assumption amounts to, is that military minds are strangers to the process of thought.

It is not the intention here to discuss the validity or otherwise of these contentions. That such an impression exists is unfortunate, even if the degree of criticism of the military mind is not as harsh as has been made out. It is unfortunate because it is precisely such prejudice which leads in the first place to a basic misconception of the military point of view, to be followed by misunderstandings, which only create complications in the finding of agreed solutions to problems of national security. If civil and military modes of thinking remain very much at variance, the problem that presents itself is to examine how best this hindrance can be removed, or at the very least, how some reconciliation can be affected. What, objectively speaking, are the constituents of the military mind, and what is the main thread that predominates in the fabric of that mind?

A SOLDIER'S MOTIVATIONS

The whole purpose of maintaining military forces is to keep the nation secure from aggression and attack. It will be admitted that the importance of such a task is paramount. The very nature of the assignment, therefore, engenders in the mind of the professional soldier who is saddled with this particular responsibility, concepts and values which are tuned to a single purpose. In other words, the field of military thought and endeavour cannot but be channeled into a singleminded determination to achieve success in war. We do not live in a Utopia, and human nature being as

raw as it is, war is inevitable. Whatever be the causes of war, and whatever the body of men that chooses war as a means of attaining the nation's objectives, it is the professional soldier and those he commands, who remain the sole instrument for executing subsequent military action.

The burden of preparing for and conducting war, is extremely heavy. In shouldering this burden, since victory must be ensured, flirtations with compromise solutions, gambling with fate, or the taking of undue risks, cannot enter into a soldier's calculations. Conservatism is, therefore, inbred in the military thought process, and if it allows for any latitude, then the bias remains in favour of over-insurance rather than the taking of risks. The purely academic approach to problems of national security may well have legitimacy, but to the military mind, pragmatism must remain the essence of all deliberation. The professional soldier chooses, therefore, to organise his forces and to adopt methods of work and control, which to others might appear harsh, and even unwarranted. A code of implicit obedience, self-discipline and the subordination of individual traits to a common group approach, are basic to a soldier's approach to the carrying out of his task. He cannot dissociate from his mind the fact that the penalty for military failure can be national disaster. It is natural for the military mind then, to rely on facts and on what is known. On the lessons of history and experience, rather than on experimentation and theory. Only calculated risks are permissible.

THE CIVILIAN APPROACH

War is an instrument of policy. National self-interest is an expression which clothes intentions, both good and bad. Ideology, prestige, competitiveness in international relationships and even downright greed, are only some of the reasons that can lead to war. The civilian mind (and it is the politician who determines whether war will be resorted to or not) has a wide spectrum over which it is obliged to range. Much of the thinking, that wanders over this spectrum, is not always marked by objectivity. Perhaps it is the very nature of his work, which demands of the civilian, a considerable degree of flexibility of approach in finding answers to problems connected with formulating policy, the sphere of national security not excepted. If the civilian is interested in the main with the possible intentions as he sees them of likely adversaries, the soldier chooses to work on the less nebulous matter of comparative military strengths and capabilities. Neither for that matter, do these two approaches to the problem necessarily agree on a common interpretation of the character of the enemy's threats to the nation. The civilian approach to an assessment of such threats is an academic one, based on intelligence gained and interpreted through civilian

machinery. It is this same information which is then fed second-hand to the military, who do not have their own sources for the collection of external intelligence. And yet it is the military who are the only element in the country answerable to the nation for defeat. Differences of opinion can deteriorate into obduracy. The point of no return may well be reached in discussion, followed by the entry into the decision-making process of the personal element. Should this happen, the battle, as it were, of achieving unanimity is lost before it has even begun. Inhibitions are not pleasent things to live with.

Civil control over the armed forces is paramount and unquestioned. In democracies there will always exist a lurking fear of the armed forces, if only for the reason that such forces do, after all, control the instruments of extreme violence. A firm and tight hold over the purse strings is an effective means of curbing any overenthusiastic demands of the forces, but undue parsimony can lead to trouble and failure. A sudden call upon the forces for military action, for example (and events do tend to overtake the best of calculations), the scope and magnitude of which was not previously appreciated due to differing opinions, could mean disaster. There does exist a military ethic in that orders are orders and must be obeyed. Irrespective of professional advice tendered, if the political decision happens to be contrary to such advice, it will still be carried out. The military mind is fully conscious of the need to relate political aims to military means. The soldier is chary of overstressing such a point lest it be construed as stepping outside his province. But if harmony in understanding is to be attained, circumspection must also be exercised by those amateurs who tend to fault the professional. Hitler, the amateur, was no Napoleon, and his country paid the price.

SOME CONCLUSIONS

It has not been the intention in this article to prove or disprove the general view held of the military mind. Indeed it is debatable whether minds can be classified as belonging to any particular category. It is possible that being grounded in individual and disparate disciplines, some minds are apt to jar on others. Traditionally, the armed forces have never been overpopular except in adversity. The fear in which they are held, reflects itself in likening them to a class whose attributes are brute force and adjectival ignorance. Equally, since civil authority has the whiphand, so to speak, prejudice can suggest that the non-military mind refuses to face reality, is overfond of argument and hair-splitting, revels in making a point in academic discussion, and hastily shelves responsibility for any failure that might attend its recommendations. If this article makes any

plea at all, it is that prejudice must be eschewed. One measure that may help in this objective, would be for the soldier to broaden his outlook by absorbing knowledge outside his profession. The writer sees no good reason why officers of the Services whose professional education is already adequately catered for, should not be seconded to Universities for study and research work. For a long time now, this has been common practice in other countries. Professional competence added to a passage of time are perhaps sufficient for reaching the top rungs of the ladder of promotion. By themselves, however, it is debatable whether they constitute an adequate criterion for holding down assignments at the highest levels of decision-making, where a breadth of vision, originality of thought, and comprehensive knowledge will always outweigh specialization.

For the civilian, whether bureaucrat or politician, it would be of advantage if they were military oriented. What is also needed, is a less stringent attitude by Authority regarding making information available to the public. Informed debate on matters of moment is essential. Witholding information on the grounds that "it is not in the public interest" to divulge it, may be valid at times. Over-working this principle has adverse effects, the least of which is a tendency towards the creation of a belief that this particular expression is no more than a cover for a multitude of sins both of omission and commission. There is a great deal to be said for following the principle of accountability of the individual, and indeed of Authority being made to respect the need for justifying its actions before the bar of public opinion.

THE TWO OLDEST PROFESSIONS —AN ANALYTICAL AUTOPSY

CAPTAIN M.K. ROY A.V.S.M., M.A., INDIAN NAVY

IN THE behaviour pattern of homosapiens, spying has been generally classified as the second oldest profession. Kautilya in his *Arthasastra* devoted a complete chapter to espionage or 'Samstah' in which he explains the principles for obtaining information and sowing intrigue or 'Pratijapa'. His book also contains a section concerning the 'oldest profession'! This is possibly because both these professions encompass the more interesting and certainly the more persistent forms of human relationship—excitement, passion, curiosity or just fun—whose end products are either hazards or a necessity for good health—individually or nationally.

Again the two vocations have other similarities which cut across social boundaries and national frontiers. For example, one observes that both have become increasingly more remunerative with the money that now changes hands becoming to appear less and less tainted. And further, the public are coming to regard the performers in these two walks of life with a greater degree of tolerance and not ostracise them as belonging to the dregs of society which Kautilya had catalogued as that of 'poisoners', prostitutes and spies!

Another similarity between these two vintage professions are their need for a competitive spirit for improving their respective images. While in the oldest profession, a certain amount of competition is perhaps necessary to produce a better performance or a more alluring presentation, it is similarly necessary for 'Intelligence' to have several agencies so as to ensure that it does not gradually develop into a hydra-headed monopoly which perforce has to defend its own assessments! Therefore in most democracies, there are several parallel and independent intelligence structures whose chief executives form, as it were, an integrated board of directors representing the intelligence community.

There are many other interesting comparisons between these two professions. Both, for example, have become increasingly more sophisticated

in their 'modus operandi' as well as in their 'calling'. Call girls, companions, strip artistes, massage girls are but a few of the different variations for the same occupation! Similarly in the intelligence community, C.I.A., K.G.B., I.S.I., I.B., M.I.6., R.C.M.P. are also some of the better known abbreviations for well publicised intelligence organization. There is even one termed just 'U.B.' which means 'ugly bastards'! An intelligence authority once said that there are as many as 46 recognized intelligence agencies in the world. Of these, six or eight were of positive values to their countries, 10 or 12 were of some value and the rest were just hazards!

WHY SECRECY ?

In spite of these apparent similarities, there are deep differences between the two professions. Whilst for instance one is related primarily to individual pursuits, the other encompasses national interests. There is hence a conflict between the basic concept of secrecy as applicable to these two vocations. Few would deny the desirability for a reasonable measure of secrecy in personal, family or even community affairs. But when nations begin to insist on a similar privacy for their national affairs it is then that confusion arises which in turn may compromise a country's obligations to its own citizens. Let us therefore pause and take a closer look at the anatomy of 'secrecy' and analyse the part that it plays in safeguarding national interests.

It is accepted that citizens should be well-informed but there is a tendency for some intelligence organizations to create artificial shrouds of secrecy such as the iron curtain, bamboo curtain or just secret operations, which have increased tensions and kept countries apart instead of bringing them closer. But one should never underestimate the basic human instinct for survival which is the mainspring of almost every national decision-making machinery.

Besides, assessment by intelligence-oriented agencies are generally based on the premise that the other country has invariably nasty intentions. This often has resulted in 'situating the appreciation' rather than objectively 'appreciating the situation'. The outcome was that intelligence operations tended to perpetuate rather than diminish inimical activity or alternatively maximise instead of minimise smaller conflicts.

To illustrate this point, it will be seen from hindsight that intelligence assessments in the Fifties concerning international communism were often quite wide of their mark both in terms of their capabilities and intentions. But such was the myth developed during the Dulles era that decisions

which at that time seemed realistic in Washington, Moscow or Peking appeared in retrospect to be founded largely on superstition, ignorance and deep-rooted prejudices. It was the policy of detente practised in recent years that has been able to push back the veil of secrecy to a certain extent and usher in Summits be they be at Peking, Moscow or Simla!

It is hence necessary for intelligence organizations to be staffed by honest operators who regard themselves not as power-hungry bureaucrats but as part of the Governmental machinery to carry out national policies. Their activities should, therefore, not be directed exclusively for ferreting out secrets but also be channeled for providing accurate data in military, political, economic, scientific, social and religious fields and indeed cover the entire range of human activities so as to construct a credible base for objective decision-making. Again the dissemination of such information should be as wide as practicable and as soon as possible.

The methods of intelligence gathering has undergone a dramatic change from the 'modus operandi' of the days of Mata Hari. A ship far out at sea, an aircraft high up in the sky, satellites with their precision cameras orbiting even higher up, electronic interceptors scattered all over the world, highly sensitive sound wave detector, ingenious lenses, microphones and technological and human sources are continuously pouring out billions of words, numbers and other data into a vast and hungry intelligence machinery which in turn passes on the digested assessments to prime ministers, presidents, cabinet ministers, or dictators.

Paradoxically, it is these technical developments that have largely restricted human imagination from conjuring up a wrong image of another country either be overestimating or underestimating their strength or weakness which may have injected a certain element of uncertainty which in turn might have encouraged a gamble conducive to a conflict. The setting up of 'hot lines' between opposing countries is but one of the recognized methods to bridge such an artificial barrier of mutual suspicion.

WRONG INFORMATION

Wrong information can be more effectively planted in an intelligence agency than perhaps anywhere else and by its very presence in such an embryo, it has a tendency to gain credibility. The many books written to justify or criticise the intelligence organization, for example, in India after the Chinese invasion is perhaps a reflection on the weakness of utilizing secrecy as an end in itself. One can but reflect what the consequences might have been if the country or Parliament had been kept fully informed of the situation accross the Himalayan border. It will thus be seen that excessive secrecy has an inbuilt tendency to keep the people in the dark without

perhaps imposing any real limitations on the enemy whose intelligence organization is anyway specifically structured to ferret out such secrets especially when they are in many cases just 'quasi open information' which is characteristic of a democracy.

Again there have been many instances where intelligence was even intended to cover up a lack of success or alternatively to camouflague some activities which did not have the requisite national support.

In addition, some organizations have even attempted to seek the protection of an artificial environment of secrecy in order to gain more elbow room for conducting operations which were based on policies which differed from the publicised ones. So much so, that there have been cases where some intelligence agencies have even acquired sufficient power, bargaining or otherwise, to have such contrary policies accepted. These have perhaps contributed to embarrassing defections such as of Penkovsky, McLean, Burgess, Philby, Petrov, Kravchenko, Martin, Gouzenico, Mitchell and many others. One even wonders whether the so-called secrets revealed by these defectors would really justify them being labelled as criminals in the accepted sense of this term. For instance, there is a lobby who feels that scientists such as Professor May or Dr Fuchs, who were pillioried during the McCarthy era for divulging atomic secrets, were to an extent responsible for preventing war by assisting the other side also to build up a balanced nuclear deterrent which by the way was their defence.

On the other hand one cannot presume that enmities will disappear as it is clear that reprisals in all forms has been increasing as seen by the kidnappings, hijackings, bombings and indeed the new spectrum of violence that has entered both the international and national scenes.

Hence while it is apparent that information concerning one's own forces, tactical doctrines and operational plans should continue to be the exclusive monopoly of the country concerned, it is not automatically implied that all other information concerning technical advances, political currents or economic policies be also hidden under a similar cloak of secrecy. For example, it is a matter of conjecture that if the people of West Pakistan really were aware of the state of law and order in the then East Pakistan and knew the strength and determination of the opposing forces, would they have still resorted to the suppression of their erstwhile Bengali majority?

NEW CONCEPT

It is this all-pervasive aspect of secrecy, perhaps encouraged by an inhibited intelligence organization, that has probably prevented the exposure

of certain international or even national aspects to the cynosure of public opinion. Today, secrecy and intelligence appear to be synonomous. And it is therefore for consideration whether such outmoded expressions of secrecy for the sake of secrecy be replaced by a concept that will encourage a more open society. It will be hence necessary that while preserving secrets which have a direct bearing on a country's national security, it will nevertheless be required to limit them to the minimum so that a larger number of questions are then exposed to the pragmatism of the human instinct for self-preservation. What is required is for the 'modus operandi' of intelligence organizations to be carefully veiled while exposing their outputs to democratic previews and pressures.

So if we retrace our steps to the earlier comparisons between the two oldest professions, we find that secrecy has been steadily eroded even in the enviornment of the oldest profession in view of the changed values in morality and permissiveness with the result that there is now a real danger of this vocation becoming gradually extinct and being replaced by espionage as the oldest profession!

This is perhaps a logical development as both vocations deal basically with human relations. And in such an environment, it is apparent that the two professions tend to tackle human problems on similar lines. And again their performance in such intimate fields of human activity cannot be gauged by merely analysing the psychological motivation behind every act. On the other hand, it is experimentation and a bold change in values that will add a more exciting chapter for a fuller life. And lastly the good performer or the outward-looking professional in either vocation will confidently get on with what is required to be done and it will only be the inadequate partner or the unsure operator that will look round for the bedsheet of secrecy to hide one's impotency!

So let us have intelligence structures that are dynamic and outward-looking and free of such artificial cloaks of secrecy. The dramatic development in modern communications and the growth of information media, has encouraged this tendency by equally exposing the Bombay housewife, the Egyptian fedayeen and the Malaysian rubber tapper to the strategy of mass communication and opinion formation. And such exposures will no doubt help in stripping both the professions of a good deal of their present mumbo jumbo of secretiveness. This process may in time result in the two oldest vocations being regarded not as instruments of suspicion and secrecy but more as media for fostering human relationships—both physically and emotionally as well as individually and internationally.

VIETNAM PERSPECTIVE

Part II

BRIGADIER GENERAL THEO. C. MATAXIS
(United States Army, Retired)

Editor's Note: In Part I of this two-part article, the author discussed the background of the Vietnam war. (See the U.S.I. Journal of January-March 1971).

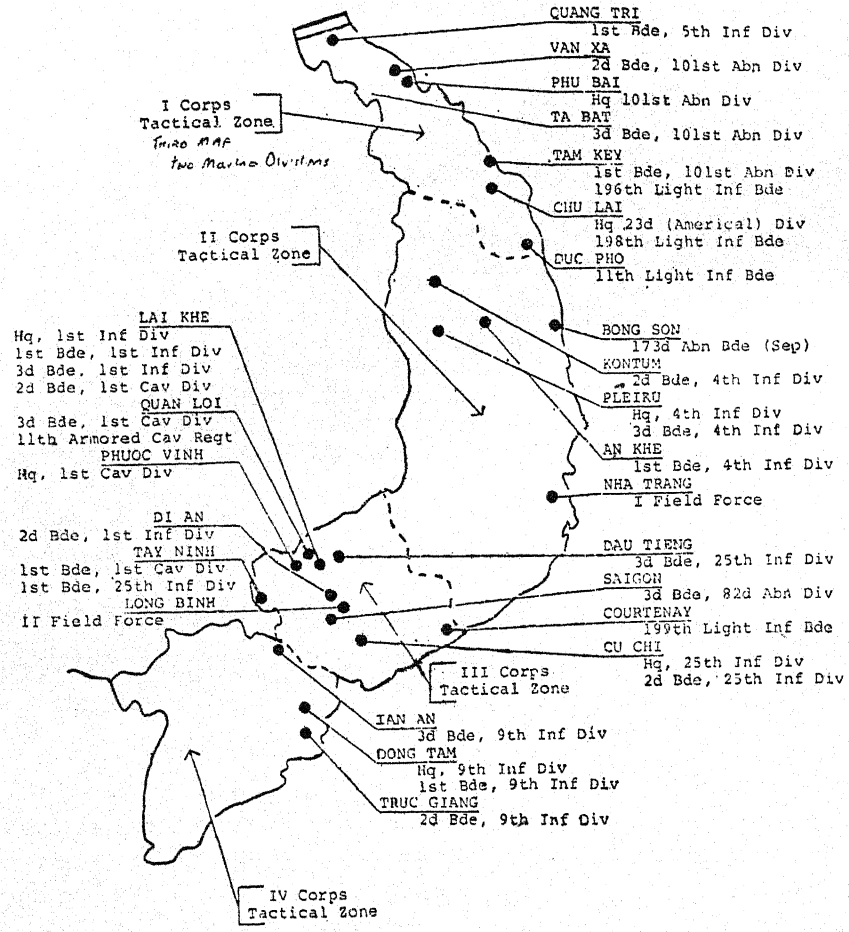
Starting with the 1954 Geneva Accords, he covered the emergence of the Viet Cong, formation of the National Front for the Liberation of South Vietnam, the invasion of North Vietnamese regular army units into the South. Also, the introduction of U.S. combat troops into Vietnam, the Tet offensive, attack against the Cambodian border sanctuaries, Vietnamization, and the beginning of the withdrawal of U.S. troops.

In the article which follows, the author first describes the mission assigned the US Army and the contribution of other countries to South Vietnam. He then looks at the maximum build-up and deployment of the US ground forces followed by a description of the three phased Vietnamization plan and the withdrawal of US and allied combat units. The article concludes with a summary of the January and June Paris diplomatic Agreements on ending the war as contrasted to the "real world conditions" in South Vietnam where the fighting continues.

AS noted in Part I of this article elements of the North Vietnamese Regular Army were moved into South Vietnam in December 1964 in preparation for a spring offensive in 1965 designed to crush the Army of South Vietnam (ARVN). Faced with the threat posed by this escalation, highlighted during TET (Feb. 1965) by an offensive in the Central Highlands and coastal areas of II Corps, the US started bombing infiltration bases and routes in North Vietnam and moved US combat troops to Vietnam in March 1965 to support ARVN. Seven years later the last US combat unit stood down prior to the final withdrawal. Let's take a look in some detail into what happened during this period.

First let us identify the missions assigned to the US Army, then take a look at the organisation of its combat forces, and, finally, the manner in which these missions were accomplished. The US Army in Vietnam was given two basic objectives: (1) prevent a Communist take-over of the country; and (2) help build the South Vietnamese Armed Forces into a military force capable of assuming all defensive and offensive aspects of the war.

U.S. ARMY COMBAT FORCES IN VIETNAM
JUNE 25, 1969



Deployment of Major Arun Units

I CORPS: Three infantry divisions

II CORPS: Two infantry divisions

III CORPS: Three infantry divisions

IV CORPS: Three infantry divisions

GENERAL RESERVE: Airborne Divisions, Marine Division; Ranger Command

As former Army Chief of staff General William C. Westmoreland said just prior to his retirement on June 30, 1972:

"... the Army's mission in Vietnam, although a complex one, has been virtually accomplished. We were directed to prevent the communist military domination of South Vietnam.

"We have clearly achieved this objective. We were also directed to train the armed forces of the South Vietnamese to enable them to defend themselves. We have substantially achieved this second objective."

This optimistic assessment by General Westmoreland, who headed all U.S. forces in Vietnam for four and a half years, remains valid despite the invasion of the south by the North Vietnamese Army in March 1972 and the continuing fighting even after two Cease-Fire agreements. As a matter of fact, South Vietnamese forces, despite some initial setbacks, have performed in a manner which leads one to hope that the second objective also will be achieved. However a realistic look at current conditions makes one realise that this second objective will be severely tested in the coming months.

At the height of its commitment in south Vietnam, the U.S. Army had the equivalent of eight and one-third infantry divisions within a total strength of more than 355,000 out of the total of over 540,000 in-country. The presence of U.S. forces in Vietnam peaked in early 1969 and then began a gradual decline as the forces were reduced as a result of the negotiations in Paris.

FREE WORLD ASSISTANCE

A common misconception is that the United States, by itself, carried the burden of the war in South Vietnam. This is not true. Five nations, on the periphery of the Asian rimland also provided combat units to support the Republic of Vietnam in its struggle against the enemy.

A fact seldom noted was that these five nations provided a greater total military strength to the war than the entire seventeen-nation force that fought with the United States and under the United Nations banner in Korea.

Collectively, the combat units of these nations were known as the Free World Forces. Although there was no supreme commander of the allied forces here, each nation voluntarily placed its combat units under the operational control of the Commander, United States Military Assistance Command Vietnam. The key motto here was "operational, coordi-

nation", a technique devised for Vietnam. This concept was a far cry from "Unity of Command" which had been the doctrinal backbone of past US army operations in World War I and World war II.

The US comander employed and located the Free World combat units in those areas where US units did not normally operate, but where the tactical situation required the continuous presence of friendly forces. Wherever possible, the principal Free World units were interlocked with the locations of US units. In the northern part of the country, in the Vietnamese I Corps Tactical zone, was the Republic of Korea Marine Brigade at Hoi An. Moving further south, to the Vietnamese II Corps Tactical zone, was the Cavalry Regiment of the Republic of Korea Capital Division located at Binh Khe; the headquarters of the ROK Capital Division and 1st Infantry Regiment at Qui Nhon; the 26th Infantry Regiment of the ROK Capital Division and the 28th Infantry Regiment of 9th ROK Division at Tuy Hoa; the headquarters of the 9th ROK Division and the 29th Infantry Regiment at Ninh Hoa; and the 30th Infantry Regiment of the 9th ROK Division at Dong Ba Thin.

Further down in the Vietnamese III Corps Tactical Zone was the 1st Australian Task Force and the Royal New Zealand Battery at Nui Dat; the Royal Thai Army Volunteer Division at Bear Cat; and the Philippine Civic Action Group at Tay Ninh City. There were no Free World Forces in the Vietnamese IV Corps Tactical zone.

Combat units of the Republic of Korea began arriving in Vietnam in October 1965. Units of the two ROK divisions were spread out along the coastal plain. ROK units operated over this large and important coastal area from Phan Rang to Qui Nhon, along National Highway One and inland from Qui Nhon to An Khe along Highway Nineteen. They opened over two hundred and fifty miles of highway and a stretch of the National railway from Phan Rang to Nha Trang.

The mission of the ROK units was to clear and hold specific areas, and this involved innumerable small-scale operations.

Not all ROK operations were of the small unit variety.

Operation MAENG Ho 6, an example of a big unit action, began on September 23, 1966, and terminated on November 9.

It was part of a search and destroy operation conducted by the US Army's 1st Air Cavalry Division and the Army of Vietnam's 22nd Division to clear the lower Phu Cat Mountains in Binh Dinh Province.

The enemy was trapped in caves and decided to make a stand there. This proved to be a disastrous mistake on the part of the enemy. In their portion of the operation, the ROK forces killed 1,161 of the enemy while capturing 518. They also seized from the enemy 454 individual weapons and 43 crew-served weapons. As a bonus effect, 67 tons of rice were also taken out of the enemy supply system.

The ROK soldier is tough, lean and hard. He is a fierce fighter—a fact the enemy learned quickly. The armed forces of the Republic of Korea have brought to the Vietnamese war an Asian psychology and an Oriental approach different from that of their Western allies.

MAJOR ENGAGEMENT

The first major engagement of a US Army combat unit in Vietnam was initiated in June 1965. In that same month, the first combat troops from Australia and New Zealand arrived in Vietnam.

Like the Koreans, the Australians and New Zealanders, who served together, were good jungle fighters. Their operations leaned toward the small unit action, the ambush and taking the night away from the enemy.

They were members of an all-volunteer professional force going about the business of war in an insurgency environment. This professionalism is best cited by an event that occurred in a late afternoon on August 18, 1966, when two reinforced Viet Cong battalions attempted to overrun one company belonging to the 6th Battalion, Royal Australian regiment.

Surrounded on all sides, the company, aided by accurate artillery fire, put up a valiant defence. The enemy was unable to overrun the company and broke contact. The enemy left 245 bodies on the battlefield. Australian losses were 17 killed and 22 wounded.

Within the Australian tactical area of responsibility, the Viet Cong infrastructure, although not entirely eliminated, was patiently and methodically fragmented by the men from "downunder." The enemy in Phuoc Tuy province was gradually ferretted out and rendered ineffective, thanks to the professional work of the Australian Army Forces.

The Republic of the Philippines contributed an engineering-construction battalion, a field artillery battery and a security battalion collectively called the first Philippine Civic Action Group or PHILCAG. The motto of these Asian "Seabees" was "to build, not to destory, to bring happiness, not sorrow, to develop goodwill, not hatred."

The primary job of the PHILCAG was to build a refugee resettlement project in Thanh Dien forest located in the former Viet Cong stronghold of War Zone "C." Despite severe enemy harassment, hundreds of acres of jungle were cleared, roads and security outposts built, school houses and homes constructed and hundreds of families resettled.

Most of the PHILCAG officers and noncommissioned officers were veterans of the guerrilla war against the Huks in their own country. The PHILCAG's approach to the insurgency problem in South Vietnam won many over to the government side. This approach also laid the foundation for postwar construction and rehabilitation in the former Viet Cong stronghold.

Thailand, already fighting a communist-inspired insurgency in its own northeast territories, committed a division to the cause in South Vietnam. Like most of the other Free World Forces the Thai soldier was a volunteer and professionally trained in jungle warfare and the techniques of counter-insurgency. The arrival of the Royal Thai Army Volunteer Division improved the overall military posture in the III Corps Tactical Zone and freed some U.S. units for deployment elsewhere within the tactical zone.

Although not furnishing combat forces, many countries of Europe and the Western Hemisphere, and several countries of Africa and the Middle East, provided the Republic of Vietnam substantial economic, technical, and humanitarian assistance, including medical supplies, textbooks, construction materials and equipment, refugee relief supplies, and foodstuffs.

They also provided generous scholarship aid to Vietnamese students so that they could obtain vitally needed training which would enable them to participate more effectively in building a free and prosperous country.

Australia, Canada, Republic of China, Germany, Iran, Italy, Japan, Korea, the Netherlands, New Zealand, Spain, the Repulic of the Philippines, and the United Kingdom sent civilian doctors, nurses, teachers, agricultural advisers, engineers, and other technical personnel—to work in the cities and rural areas of Vietnam to help bring a better life to the people.

Medical and surgical teams from a dozen nations, in addition to the United States, provided medical care—largely in provincial hospitals. West Germany maintained a hospital ship at Da Nang, Canada provided ten 200-bed emergency-hospital units. These are but a few examples.

A large number of Vietnamese military and civilian police were

trained by Malaysia since 1964. Groups of 30-60 were sent regularly for a month's training in counter-insurgency with the Malaysian Police Special Constabulary. Substantial amounts of counter-insurgency materials, primarily military and police transport such as armoured vehicles, were provided.

Considering the size and economic ability of most of these free world nations, their support was significant.

U.S. COMBAT FORCES

All U.S. Army combat units were under the operational control of the Commander of the United States Military Assistance Command Vietnam. The U.S. Commander in Vietnam was assisted by force commanders in the daily running of the war. A force commander could be likened to a corps commander. This term, however, was not used, because it conflicted with Army of Vietnam corps commanders who held these titles long before U.S. Forces arrived in country. Here the motto was "operational coordination", a concept designed to recognise that the U.S. Vietnamese and other allied troops were not under direct command of any but their own National Headquarters. As has been noted this was a most complex war, and some of the military concepts under which the forces operated were specifically designed to meet political objectives.

Major deployments of combat forces as of June 25, 1969, were as follows:

In the northern part of the country was the commander of the Third Marine Amphibious Force or Three MAF. His area of responsibility covered five provinces and corresponded roughly to the Vietnamese Army I Corps Tactical Zone. Tho operations conducted by two marine divisions of the Third MAF and their attached army troops were normally named after U.S. counties. The commander of the Third MAF also served as the senior U.S. Advisor to the Vietnamese Army I Corps commander. This was a responsibility which was taken over from the MACU Senior Adviser in each Corps area. Prior to arrival of U.S. combat troops the chain of Command for the U.S. ran from MACU HQ to the Advisory Teams at each Corps and Division. The headquarters of the Third Marine Amphibious Force was at Da Nang.

The principal Army combat units under Third MAF in the I Corps Tactical zone were the 1st Brigade of the 5th Infantry Division (Mechanized) at Quang Tri: the 3rd Brigade of 101st Airborne Division (Airmobile) at Ta Bat; the 2d Brigade of 101st Airborne Division (Airmobile) at Van Xa; the headquarters of the 101st Airborne Division (Airmo-

bile) at Phu Bai, its 1st Brigade and the 196th Light Infantry Brigade at Tam Ky; the headquarters of the 23d (American) Division and the 198th Light Infantry Brigade at Chu Lai; and the 11th Light Infantry Brigade at Duc Pho. During the latter phase of operations on this area the XXIV Army Corps HQ was formed to reduce the span of control in the Third MAF area of I Corps. When the two Marine Divisions and the Third MAF HQ were redeployed the XXIV Corps took over control at the redeployment of the remaining Army troops.

The 1st Brigade of the 101st Airborne Division arrived in Vietnam in July 1965. The remainder of the division was in-country by December 1967. Various units of the north Vietnamese Army and the Viet Cong soon became familiar with the shoulder patch of the 101st at places with names such as An Khe, Dak To, Pleiku, Ben Cat, Phan Thiet, Phan Rang, Nha Trang, Tuy Hoa and Qui Nhon, and developed a healthy respect for what this patch embodies. The small unit tactics of this brigade enabled it on many occasions to "out-guerrilla" the guerrillas.

The 3rd Brigade, 82d Airborne Division, arrived in Vietnam in 1968 and was attached to the 101st Airborne Division (Airmobile). The Brigade assisted in protecting the ancient capital of Hue and later helped in guarding the western flanks of Saigon from enemy attacks.

The American Division, the largest in Vietnam grew out of a task force which was organized in the spring of 1967 to beef up US combat strength in the Vietnamese Army I Corps Tactical Zone. Prior to that time, two Marine Divisions were spread the length of the five-province coastline. The infusion of the American Division enabled Marine units to concentrate more force up around the Demilitarized Zone. Forces for the division initially came from Army combat units based elsewhere in Vietnam. At one time, there were as many as five brigades assigned to the division. The division did an effective job covering the lower two provinces of the tactical zone.

The US Commander, I Field Force Vietnam, had as is his area of responsibility the central highlands and most of the coastal plain, and corresponded to the Vietnamese Army II Corps Tactical Zone. Again, the force commander served as the senior US Advisor to the Vietnamese Army II Corps Commander. I Field Force was headquartered at Nha Trang. The operations conducted were normally named after famous US persons.

The big Army units were the Ist Brigade of the 4th Infantry Division

at An Kher; the 2nd Brigade of the 4th Infantry Division at Kontum; the headquarters of the 4th Infantry Division and its 3rd Brigade at Pleiku; and the 173rd Airborne Brigade (Seperate) at Bong Son.

The job of the 4th Division was essentially one of screening the highland borders and stopping any attempt by large enemy forces to cross into the highland and occupy terrain of tactical or political significance.

The 173rd Airborne Brigade (Separate) was the first Army combat unit committed to Vietnam. During 1965 and early 1966, a battalion from the 5th Royal Australian Regiment operated with it. The Brigade subsequently had another airborne battalion organically added to it, and the "Aussie" battalion operated in its own Australian task force.

The 173rd originally operated in the area down around Saigon and also served as the MACV reserve. It participated in several large-scale US operations, fought in many a bloody battle, earned two presidential unit citations, and made the first big unit combat jump of the war during Operation Junction City in 1967.

RESOURCES CONTROL

In addition to search and destroy operations conducted by US forces, these forces participated in what was commonly known as rice harvest protection operations. Like search and destroy, rice harvest protection was a form of resources control. In the latter case, it was a systematic effort of denying the enemy his staple food—rice.

Rice furnished him his protein, fat, starch, sugar, minerals, fibrous matter and vitamin B. Weapons gave him the capability to fight, rice the strength to fight. When a crop was ready for harvesting, Army units moved into the area and sealed it off from enemy units operating there while the protected farmer gathered his rice and moved it to market. The enemy was forced to look elsewhere, or if desperate, to come out and fight for the prize.

The area of responsibility of the US Commander, II Field Force Vietnam, corresponded roughly to the Vietnamese Army III Corps Tactical Zone and at one time overlapped into the Vietnamese Army IV Corps Tactical Zone. The force commander served as the senior U.S. advisor to the Vietnamese Army Commander of the III Corps. The operations conducted by II Field Force were named after US cities. II Field Force was headquartered at Long Binh.

The principal Army combat units based there were as follows: the headquarters of the 1st Infantry Division, the 1st and 3rd Brigades of the 1st Infantry Division, and the 2rd Brigade of the 1st Cavalry Division (Airmobile) at Lai Khe; the 3rd Brigade of the 1st Cavalry Division (Airmobile) and the 11th Armored Cavalry Regiment at Quan Loi: the 1st Brigade of the 25th Infantry Division and the 1st Brigade of the 1st Cavalry Division (Airmobile) at Tay Ninh; the headquarters of the 25th Infantry Division and its 2nd Brigade at Cu Chi; the 3rd Brigade of the 25th Information Division at Dau Tieng; the 3rd Brigade of the 82nd Airborne Division at Saigon; the 2nd Brigade of the 1st Infantry Division at Di An; the 199th Light Infantry Brigade at Courtenay: and the headquarters of the 1st Cavalry Division (Airmobile) at Phuoc Vinh.

The force commander conducted multi-divisional size operations. Cedar Falls, which made the so-called Viet Cong Iron Triangle a useless piece of real estate, is an example of one. Junction City, which penetrated deep into War Zone "C," and among other things, disrupted the enemy's command and control network of its shadow government and military units around Saigon and in the Delta, is another example.

The 1st Infantry Division participated in these and many other operations. Elements of the division worked the swampy approaches along the main shipping channel to Saigon all the way to the Cambodian Border in War Zone "C." The principal protagonist of the division was the 9th Viet Cong Division and the 101st North Vietnamese Army Regiment.

The 25th Infantry Division, like the 1st Infantry Division, ranged far and wide over the area west and northwest of Saigon to the Vietnamese border in its continuous search to find and destroy the sometimes elusive enemy.

Likewise it participated in the big multi-divisional operations in the Iron Triangle and war Zone "C." The Division met and defeated the enemy in other places where the Viet Cong influence had reigned supreme for several years.

The 1st Cavalry Division (Airmobile), originally deployed to the Vietnamese II Corps Tactical Zone, was the first big unit to prove that the U.S. Army, under certain tactical situations, could move and fight land battles employing the helicopter as the principal vehicle for movement.

The division fought the U.S. Army's first large-scale confrontation with the North Vietnamese Army in the highlands during the fall of 1965. The division bloodied the enemy badly and sent him reeling back across the

neutral borders in a series of clashes called the Battle of the Ia Drang Valley.

The division, along with the 3rd Brigade of the 25th Division, worked the highlands until the arrival of the 4th Infantry Division. After this, the "First Team" focused its attention down on the Coastal Plain, principally in Binh Dinh province. Together with the two Republic of Korea Divisions, it fanned out along the plain, concentrating in the heavily populated areas of Bong Son and weeded out the enemy hamlet by hamlet—tunnel by tunnel. During the 1968 Tet offensive, the entire division was moved to the vicinity of Khe Sanh where it stayed and fought until the North Vietnamese Army broke off contact and withdrew across neutral borders.

Prior to its inactivation, there was one big U.S. Army unit in the Vietnamese Army IV Corps Tactical Zone. This was the 9th Infantry Division. Headquarters of the division and its 1st Brigade were at Dong Tam, its 2nd Brigade at Truc Giang and its 3rd Brigade at Tan An.

RIVERINE FORCE

To counter the unique problems of operating against the Viet Cong in the Delta region, a joint Army/Navy Riverine Force was organized. It was the first U.S. operation of its kind since the Civil War. The primary combat unit of the Riverine Force was the 9th Infantry Division. Battalions of the division were supported by the river assault boats of the U.S. Navy Task Force 117.

This small fleet consisted of a variety of special vessels tailored to operate on inland waterways and cannals of the region. There were armoured troop-carriers, which could move one fully-equipped platoon of infantry into almost any canal, creek or stream in the delta. There were the monitors, which furnished direct support to the armoured troop-carriers. There were the self-propelled auxiliary barracks ships, which had billeting messing, storage, hospital and dental facilities abroad for more than one thousand troops per ship. There were also command and communication boats, landing craft repair ships and various resupply craft.

The overall configuration of the Riverine Force allowed troops of the 9th Infantry Division to fight in an amphibious environment. This gave them the staying power to slug it out with the Viet Cong for days on end and, ultimately, weed him out canal by canal—paddy by paddy. This then is a very broad-brush treatment of the deployment and stationing of the major U.S. Combat forces in Vietnam.

Although not assigned to U.S. Army, Vietnam, hundreds of senior

Army officers and noncommissioned officers continued to work with and advise Vietnamese Army forces even after the entry of US combat troops. These were spread throughout all four corps tactical zones and worked with Vietnamese soldiers from battalion and regimental level up to the Joint General Staff level of the Vietnamese Armed Forces. US Army personnel also worked as advisors with Vietnamese District and Province Chiefs. Battalion and regimental advisors continued to live, eat, sleep and fight with the Vietnamese troops to whom they were assigned as they had in the early 1960's before the entry of large numbers of US combat units. All of these personnel continued to be assigned to the US Military Assisstance Command, Vietnam (MACV), however the US Force Commanders had operational control of the Advisory Teams in their areas.

VIETNAMIZATION

As noted in part One, during the fall of 1968 the US began a programme of strengthening the Vietnamese Army. This programme was called Vietnamization. These MACV advisors played the principal role in Vietnamization, President Nixon's programme of turning the war over to the South Vietnamese. This programme involved three channels of effort. First was an expansion of South Vietnam's Armed Forces to one million men. Second was a massive equipment modernisation programme and third was assumption of the main combat role on the battlefield by ARVN. Success of this programme, in turn, meant a declining need for American forces. As a result of the rapid growth and increase in combat power of the Vietnamese Armed Forces President Nixon was able to make an announcement of gradual withdrawal of combat troops culminating in the surprising announcement in the spring of 1970 of the planned withdrawal of 150,000 troops.

While the concept of Vietnamization was perfectly straightforward to anyone who would read its objectives, partisan mass media and those who disagreed with the US involvement in SVN persisted in questioning its feasibility. As a result as late as March 1971 the former Secretary of Defence, Melvin R. Laird, was still attempting to explain to the House Armed Services Committee the three distinct phases of Vietnamization. He patiently explained :

"——*The First phase* consists of turning over to South Vietnam the ground combat responsibility against VC/NVA forces. As I have said many times before, we expect to complete Phase I by this summer, although American ground combat forces will remain in a security role to protect US forces as Phase II progresses.

"——*The Second phase* consists of developing within South Vietnam the air, naval, artillery, logistics and other support capabilities necessary to maintain effective independent security. Phase II has been in process concurrently with Phase I, but it will take longer to complete because of the complex training involved.

"——*The Third phase* will consist of reducing the American presence to a military advisory mission, together with whatever small security forces are needed to protect this mission. Further, reductions to our assistance and advisory presence will then continue, under the Nixon Doctrine, as South Vietnam continues to grow in national strength and self-reliance, until no more U.S. military presence is required".

A look at the record will verify the success of the Vietnamization project. August 1971 marked the end of Phase I. At this juncture U.S. forces stopped all major offensive operations and reverted to defense of their own positions and areas. The burden of the ground fighting at this point was now entirely on the collective shoulders of the forces of the RVN.

By January 1973, Phase II reached a point where the United States had turned over the primary responsibility for in-country air, logistics, and artillery support to the South Vietnamese. The South Vietnamese are now training their own pilots, mechanics and maintenance men. There were over 2,500 trained pilots compared to 399 four years ago. There were over 1,300 combat aircraft being operated by the South Vietnamese compared to 200 four years ago.

Phase III officially began in July 1969 with the stand-down of the first U.S. combat manoeuvre battalion. During the month of August 1972 the last U.S. combat manoeuvre battalion commenced stand-down. At the beginning of this phase, US forces were at a peak strength of 540,000 personnel. By the spring of 1973 the objectives of the Vietnamization programme had been realised and the U.S. military forces reduced to a small number under the Military Attache, Maj Gen Murray, former Logistics Officer of MACV HQ.

The path to Vietnamization was not accomplished without some anxious periods however. For example, with the announcement of President Nixon's massive withdrawal plan in the spring of 1970 the enemy forces started a massive multidivision buildup in their Cambodian/Sanctuaries near Saigon. At this time, as noted in Part I, the arguments between the Cambodian government and communists over these base areas broke out in open disagreement. The Cambodian National Assembly voted to

remove Sihanouk and to have Lon Nol retain control of the government as prime Minister. This was followed by a closure of the Port of Sihanoukville, renamed Kampong Som, and the seizure of the trucking companies which had been transporting weapons, munitions and other material from the port to the border sanctuaries.

To counter these moves the enemy turned his troops, and attacked westward into Cambodia isolating the capital, Phnom Penh. By mid April 1970 the Cambodian Government was under such pressure that it called on friendly powers for military assistance. A U.S. intelligence assessment at this time indicated that unless it received assistance the Cambodian Government would soon crumble leaving the enemy in firm control of a large base area from which to launch multidivision attacks into Vietnam. This would give them the capability of not only destroying President Nixon's timetable of withdrawing 150,000 U.S. troops announced in mid April 1970; it raised the spectre of a massive Dien Bian Phu trapping large number of remaining US troops.

To counter this threat and to gain time for Vietnamization President Nixon decided on action against the border sanctuaries. The enemy's losses in this attack combined with the Vietnamese Army's pre-emptive strike against the Laotian supply lines in the spring of 1971 was most successful. It so disrupted the enemy's supply level in the south that it was nearly two years after the attack into Camdodia and Laos before he was able to build up levels of replacements, weapons and supplies to support his next attack.

The Vietnamese used this time to re-equip and re-train their troops so that they would be ready to handle the expected attack without the assistance of U.S. ground combat troops.

SERIES OF ATTACKS

The test came during 1972, when the North Vietnamese made a series of attacks against South Vietnam to seize several provincial capitals which the Vietcong (PRG) could use as their political centres rather than the deep jungle hideouts which they now are forced to use. A second objective was to inflict heavy casualties on the forces of the Republic of Vietnam, and thus demoralize their fighting capability. It was hoped that this would in turn create a lack of confidence among the people of South Vietnam in the ability of their army and government to protect them, causing them to turn to the PRG.

The endurance and determination of the South Vietnamese ground

forces, bolstered by U.S. air and logistics support, turned the tide of this invasion without help from American ground combat forces. Quang Tri, the only provincial capital to fall to the enemy, was later retaken by RVN Forces. The defence of the city of Kontum in MR II and the defence of the city of An Loc in MR III helped to stem this invasion. The Communists' failure in this offensive turned emphasis once again to the Peace talks in Paris.

Finally, on 23 January 1973 an agreement on ending the war and restoring the peace in Vietnam was initialed in Paris by Dr. Henry Kissinger on behalf of the United States, and Special Advisor Le Duc Tho on behalf of the Democratic Republic of Vietnam. The agreement was formally signed by the parties participating in the Paris Conference on Vietnam on 27 January 1973 at the International Conference Centre in Paris. The cease-fire went into effect the same day at 2400 Greenwich Mean Time.

According to the agreement, all Americans held prisoners of war throughout Indochina would be released within 60 days. During the same 60-day period, all American forces would be withdrawn from South Vietnam. The agreement also establishes a four-party joint military commission, an International Commission for Control and Supervision (ICCS) as well as other means to insure its implementation.

The agreement guarantees the people of South Vietnam the right to determine their own future, without outside interference. The United States continues to recognize the Government of the Republic of Vietnam as the sole legitimate government of South Vietnam. And the United States will continue to aid South Vietnam and Support efforts by the people of South Vietnam to settle their problems peacefully among themselves.

As noted in the introduction to this two-part article I stated that "To describe the situation in South-East Asia is at best a difficult undertaking for the most astute observer—particularly since most of us tend to focus on what we want to see rather than what is before us." I also stated in Part I that "perhaps never in history has the public consciousness been so deluged with opinions of people who have so little or no personal knowledge of the country about which they are talking". With this in mind I believe this statement by the Prime Minister of Singapore Mr Lee Kuan Yew in a speech this spring at Lehigh University in America regarding the effect on South-East Asia of the Vietnam War serves as a fitting summary to this article.

"Whatever the rights or wrongs of the intervention in Vietnam, one beneficial result of the conflict, and the way it has ended, is that it has broken the spell on other South-East Asians, that the wave of history was on the side of the communists. Their victory was shown not to be inevitable. The fact that there are viable non-communist countries in South-East Asia today, whatever their varying claims to democratic government, was because that streak of communist wins in China and North Vietnam was checked. Otherwise, people in the rest of South-East Asia might have been stamped into the communist millenium."

EPILOGUE

During the past few months since the January Cease-Fire the fighting has continued in Vietnam. In addition to the fighting continuing the propaganda war has also continued with both sides pouring out such a mass of material that the situation has been further obscured rather than clarified. The actual condition existing in South Vietnam has been best described by the Chief Canadian delegate to the Cease-Fire Commission when he said : "We came here to supervise a Cease-Fire. In fact what we have been doing is observing a War."

This continued fighting between the South Vietnamese and the communist forces led to a questioning of the usefulness of the agreement which was signed in January. For example during the fighting after the January agreement Saigon claimed there were 30,000 additional casualties. This failure to establish an effective Cease-Fire led to another round of diplomatic meetings which resulted in another agreement signed in early June which in effect reaffirmed the January agreement. This additional meeting in June 1972 between the U.S. Presidential Adviser Dr Kissinger and North Vietnam's Politburo Member Mr Le Duc Tho has, indicated how difficult and complex the situation remained even after the initial Paris agreement which was to have ended the war.

To further complicate the situation Canada has stated it will withdraw from the International Commission of Control and Supervision. In explaining their decision Canadian officials reported in the press that there was "open collusion of the East Europeans with the North Vietnamese and Vietcong." When asked for comment on these charges, the fourth member of the ICCS, the Indonesians, said "they don't place blame but try to stay in the middle". They did comment however that the Polish and Hungarians could not react rapidly because "they have to ask their government's permission on any important thing on which the ICCS ought to act quickly". About the only thing all members of the ICCS agreed upon was that "it could not be effective unlesss both Vietnamese sides decide they really want peace and reconciliation".

Shortly after this however the influential Indonesian newspaper Pedomen (Guidance) called for the withdrawal of Indonesian troops from the ICCS calling it "sterile and apparently hopeless." They based their feeling of futility on the statement of the North Vietnamese Army Chief of Staff to his troops in the South. He is quoted as having said "there will be five not four States there—Cambodia, Laos, South Vietnam, North Vietnam and the PRG (Vietcong)—the Vietcong territory will stretch from Quong Tri province in the North to the Cambodian border including part of the Mekong Delta." The Jakarta editorial said "In view of all this, we are of the opinion that it is better to recall Indonesian troops from Vietnam. Perhaps not now, but in three or four months."

It is interesting to note that this trouble with the ICCS was forcast in an article published in the October 1967 *Foreign Affairs*. In an article, titled "VIETNAM : CRISIS OF INDECISION," Mr Shaplen questioned possibility of success of a Geneva-type International Control Commission. He said "Not only would the members end up in bickering and in vetoing each other's purposes and prerogatives, but they would conceivably tend to exacerbate friction among the Vietnamese."

As fighting and charges and counter-charges continued even after the second agreement in June one fact emerges loud and clear. There can be no peace as long as Hanoi and the Provisional Revolutionary Government (PRG) of South Vietnam maintain their determination to replace the existing government of South Vietnam by force. It South Vietnam is able to weather successfully the military pressure which North Vietnam continues to apply they may be able to raise the cost to North Vietnam so high that they will be prepared to finally settle their differences with South Vietnam at the conference table.

Once this happens the International Commission of Control and Supervision, with the support of both sides, will be able to assist in establishing an effective Cease-Fire. Until this happens all they will be doing is "observing a war".

STRIKE HARD AND DEEP

MAJOR GENERAL O.S. KALKAT, PVSM

THE current pattern of defences along the international border, particularly since these have been strengthened and developed over a period of years into an elaborate network of defensive drains, ditches and canals with concrete pillboxes and other entrenchments, can impose tremendous restrictions on the concentrated use of either an Armoured Division or an Infantry Division, i.e., advancing along one or two axes with Bdes/Bns leading and eliminating the enemy's resistance en route. It is essential that we revise our concept of offensive operations and have a deep probe into the present pattern. We must go in and strike hard and deep to achieve decisive results.

The entire concept of the advance operation of war needs to be changed. The present teaching envisages an advance guard clearing the existing axis and brushing aside minor opposition encountered frontally. Thereafter, a firm base is established astride the axis to probe the flanks and to cover the build-up of the major force (main body for an attack). This is obviously time-consuming and expensive in casualties and is totally unsuitable to meet our perspective operational requirements.

In view of the availability of a large number of roads/tracks, it is difficult to defend all the ingress routes. The best answer is for the task force to advance cross-country preferably through crops and along the existing village tracks. Even if own advance is detected, enemy reaction along subsidiary axes will be slow and piecemeal. The initial advance will have to be at night. The follow-up echelon should advance at first light. In the meanwhile, leading task forces should detach small patrols. OPs and LOs to infiltrate towards and behind the second obstacle belt in order to obtain and feed back much needed information.

OFFENSIVE OPERATIONS

To make best use of the armour and fire-power it is imperative that once a successful crossing has been effected across the border obstacle belt, Regimental/Battalion combat groups should be launched quickly. These groups should try and penetrate deep inside enemy territory on an extended front. Use of these combat groups on a wide front will ensure that the

enemy will have to disperse his efforts in countering these thrusts. These combat groups must be fully mobile with infantry mounted on APCs and should be self-contained for at least 72 hours. The range of the initial thrusts, which will be fully supported by own air effort, should not exceed the range of own medium artillery. Heliborne troops of a Battalion strength can be effectively utilised in conjunction with these combat groups to isolate strong points and prevent the move of enemy reinforcements.

Since the opposing commander will be faced with the dilemma of reacting to a large number of combat groups, he is likely to delay his retaliation or commit his force piecemeal, thereby reducing the strength of his delaying/main position. In any event, he is unlikely to do much damage to the combat groups by the time the rest of the formation is built up. He will then be forced with the choice of either vacating the delaying position/positions or thinning them out in one or two areas thereby giving the advancing commander the choice of exploiting success at least on one or the other axis.

The tactical aim of the advance should be to upset his design of battle and compel him to react wildly and commit his forces piecemeal. In order to achieve this aim, priority should be given to the following tasks:-

(a) Creation of panic and confusion amongst the civil population.

(b) Isolation of the chosen lodgement areas.

(c) Disruption of enemy command and control apparatus.

(d) Acquisition of laterals for own use by seizure of nodal points by infiltration forces.

(e) Disruption of enemy artillery and anti-tank effort.

The advance must be executed with speed to get the best out of a short war fought at great intensity. This would enjoin on the forces the vital need for taking risks and pursuing operations capable of being sustained at a high tempo for four to six weeks. They will have to debouch while in close contact with the enemy over areas of ground populated with fanatic and well motivated people with strong defences along water obstacles or in built-up areas guarding the existing main routes of ingress.

Considering the vulnerability of advancing forces to hostile air force and the paramount need of concealing all routes of ingress and the speed of advance, all advance practically will have to be either by night or during the period of bad visibility by day. The advance along or astride the main axis will be prohibitive in casualties. Therefore, on this account alone

there is need for the advance by the bulk of the forces to be conducted at night so that troops are dug down and are ready to face enemy counter-action at first light both on the ground and from the air.

COMMAND AND CONTROL

In the field of command and control much greater reliance will have to be placed on thorough briefing of the various commanders on the overall design of battle. Regulation and control of operations will have to be by means of radio communications and extensive use of liaison officers. The tempo of operation should be kept so high that by the very speed of operations, the requirements of security can automatically be taken care of. In the matter of signal security, as the battle progresses, restrictions on the use of radio communications will be lifted. Transmissions will be kept to the absolute minimum and a number of sets at each successive higher headquarters should be kept tuned to pick up the trends of the battle. This will help in building up a clear picture of the battle situation and keeping all subordinates informed of the progress of the operations. In turn, this process will help immeasurably in furthering the overall design of operations.

SUGGESTED REORGANISATION

The present organisation of an Infantry Division and the Armoured Division is not suitable to fight the type of operations envisaged above. It is recommended that we immediately earmark three to four Infantry Divisions as Strike Divisions and organise them as under:—

(a) One Bn in each Inf Bde should be based on APCs.

(b) All such Inf Divs must have their integral Armd Regt.

(c) All Strike Divisions must have an Armd Bde permanently grouped with them. This Armd Bde should have three Armd Regts, an APC Bn and an integral Field SP Regt.

(d) One Inf Bn per Division should be trained in heliborne operations.

The above organisation will give the Divisional Commander the capability of having four combat groups comprising one Armd Regt and one APC Bn each. This organisation will also give him sufficient flexibility to group his force and regroup it quickly, based on the terrain and enemy opposition.

ADVANCE BY BATTLE GROUP

Battle groups, regardless of their size and composition, should have the following elements:—

(a) Local surveillance screen with tasks similar to surveillance group of the Division.

(b) Task forces comprising three or four combat teams on either side of the battle group's axis of advance. These should operate so much ahead of the main body (moving along the oxis) that they contact first enemy opposition at or ahead of time when the leading elements on the main axis hit the enemy delaying elements.

(c) Battle group HQ and reserve should move behind the leading elements on the axis preferably mounted on APCs to move in support of any one of the task forces deployed forward.

(d) Bulk of the engineer effort assigned to each axis of advance should move behind the leading elements along the axis so as to commission it as fast as possible.

CONCLUSION

An offensive of this nature has four main ingredients. First, there must be the willingness on the part of Commanders to change their mental outlook; secondly, troops will have to be trained to fight mostly at night and under confused conditions; thirdly, a bold and daring leadership should be cultivated; and lastly, a very extensive and elaborate network of radio communication is absolutely vital for success. An all-out effort must be made to crack the defender's morale. This can only be done by the application of relentless and constant pressure and bold offensive action at all levels.

COST REDUCTION THROUGH VALUE ANALYSIS

BRIGADIER A.S. APTE

VALUE Analysis is a comparatively recent innovation which aims at finding alternative ways to provide the prescribed function at a lower cost without sacrificing the required performance standards. This technique was born in the USA during World War II when manufacturers had to look for substitute materials, designs and processes due to high cost shortage or non-availability of usual materials. In their quest for alternatives, some of the big corporations discovered that the selected substitutes not only served the purpose equally well, but they were very much cheaper also. The art of Value Analysis (or call it 'science', if you please) was codified and systematised by a respected design engineer of the GEC by the name of L.D. MILES, now acclaimed as the Father of Value Analysis. His text book has even been translated into German and Japanese.

Value has been defined as the lowest price for a function with the prescribed quality. It is a relative term. A glass of cool water has different values in the desert and in an airconditioned environment. We might, therefore, say that value increases with utility. Depending on the type of utility attributable to it, any given item may have 'use value' or 'esteem value' or both. Some industries are more concerned with "use value" while some others, such as those dealing with cosmetics or certain types of household products, are equally concerned with "esteem value' also. This utility, which may be functional or esteem-wise, is a relative parameter and there is very little that can be done to increase it to the satisfaction of all. Therefore, the only other way to increase value is by reducing the cost of the prescribed function.

This process of reducing the cost of the prescribed function, without sacrificing the required standard of performance, is known as value analysis. One would think that if that is what VA is, it is simply "good design practice"! So it is. However, for various very good reasons, even a brilliant designer cannot foresee some of the aspects at the design stage. Sometimes the prevailing "state of art" gives him no scope to use materials or processes which do not happen to be around at the time. Technology is

indeed moving at an incredible speed. Take, for instance, the numerous metal parts used in any water delivery system employed in firefighting. Gun-metal (which has a sizable foreign-exchange content) continues to be used for this purpose even though alternative and cheaper materials are now available which can withstand the prescribed pressure and otherwise confrom to the required standards of performance.

VA has universal application. Its principles and techniques are equally applicable in all fields. Yet, my own observation is that this novel cost-reduction tool is not yet seriously exploited in our country—both in the public and the private sectors. A few ad-hoc efforts have been made here and there but that is about all. There is no sustained and large-scale effort in this direction as yet. Perhaps it is for this reason that different people seem to have different notions about this comparatively new innovation.

RESISTANCE TO CHANGE

A value analyst constantly seeks change. It is precisely this change that everybody resents. The designer particularly is apt to look upon the suggested change as criticism of his design. Every value analyst faces this fundamental problem in human psychology of resistance to change. Often, this resistance takes a variety of forms. It may appear in the shape of outright hostility, sly pricks, stubborn refusal to furnish meaningful cost data or even presentation of grossly inaccurate technical data which can be completely misleading. I have experienced this more than once. A component called "transister clip" is used in a certain electronic equipment. Some 30 such clips are used in each unit. Its high manufacturing cost attracted my attention and when I questioned the function of this item I was told that it served as a heat sink. Now this answer did not satisfy me because none of the transisters used in the equipment had current ratings warranting the need for heat sinks. The shape and the polished finish of the item also indicated the same thing. Further questioning showed that the function of the clip was no more than to hold the transister in place. And yet the function as given out initially was so vastly different !

No value analysis study team can function without the wholehearted cooperation of the firm's expertise in design, purchase, production and costing. Non-cooperation shows itself in a variety of ways. One way is to be casual about furnishing the data. During the VA study of a certain electronic item, I came across a metal plate (approximately 4″ x 2″) with a round hole at one end. When I wanted to know the function of this plate, the answer given was "it is a meter mount". When I questioned that

material used for the plate, I was told that the plate was made as per the specification of the meter supplier. When I contacted the meter supplier he told me that this was not the case at all. So I insisted on seeing the plate in its proper environment. Only then the real function of the item was established; it served as a mount for a buzzer! The plate had to be secured to the inside of the front panel at two places. Since the meter was positioned nearby, it served as a suitable anchor for the plate and so a hole was cut in the plate for the meter to pass through. Thus the function now disclosed turned out to be quite different from the one stated before! Even the firm's own "in-house" VA team would face similar non-cooperation from its various departments, although to a less extent. Thus, irrespective of whether the "in-house" team is based on design department or the purchase department, the original designer of the product is not going to like his design being critically looked into by one of his colleagues. That is why it is generally acknowledged that the right place for the VA Manager is directly under the top management. Only then can he be sure of cooperation, willing or otherwise, from the other departments.

EFFECTIVENESS OF VA

In a highly competitive business world the need for survival constantly demands newer and better tools for cost reduction. Value analysis has only comparatively recently joined the long list of innovations directed towards the cost reduction efforts. A firm which is fully cost conscious and practises all the various conventional methods of plugging bigger holes in its wallet should certainly go ahead with value analysis. But if this is not the case, it is doubtful if VA will be fully effective in such a firm. For example, the firm in which the purchase department indulges in wasteful or other malpractices should first put that right. Much more savings will accrue that way, rather than by application of VA. Introducing VA without due regard to conventional cost reduction efforts is like being penny-wise and pound foolish.

Some of the factors which contribute to unnecessary costs are :

(a) Over-insurance in specifications, including unnecessary emphasis on high finishes and tolerances, is one such factor. Here is an example of unnecessary electrical tolerances. Some 100 odd imported tantalum capacitors were being used in a certain equipment. Indigenous equivalents were found satisfactory in all respects including the performance in the prescribed extreme temperature environment. Therefore, when I wanted to know the reason for the continued use of the imported tantalum condensors I was told that the leakage current was found to be

slightly higher in the case of the indigenous equivalent. A study of the circuit showed that except in a few cases, the leakage current was not at all a critical factor. It was, therefore, recommended that except for these few, all the other capacitors should be indigenised immediately, so that there is a substantial saving in the foreign exchange.

(b) Thoughtless use of "tailored" parts where standard components would do.

(c) Over-provisioning of facilities not specified or not required by the customer. For example, some radio sets available in the market have, in addition to the normal speaker output, the facility for headphone output as well. In our country at least, where people love blaring loudspeakers, I wonder whether a large majority of customers care for the headphone facility at all. Elimination of the headphone output and the associated circuit elements would certainly bring down the costs, make the product competitive and increase the profitability.

(d) Use of wasteful manufacturing processes. The transister clip which I mentioned earlier is such an example (see Illustration 1).

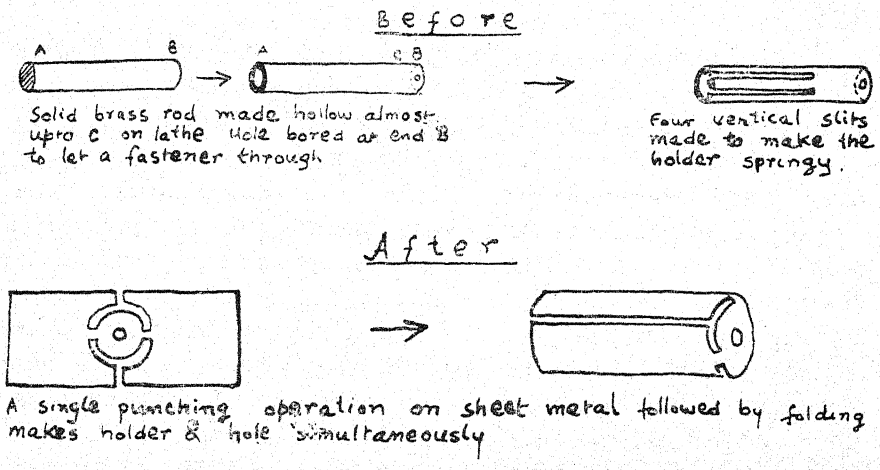


Illustration 1

The clip was being made in lathe by boring a hole in a brass rod along its length, cutting four vertical slits in the wall of the tubular container thus formed (to make it resilient) and finally boring a small hole in the centre of the closed end to allow a fastener to pass through. A much cheaper and equally effective method was suggested. This consisted of just two operations :

punching from a flat metal sheet and folding the resultant pattern to form the holder. The cost was slashed by 90%.

(e) Habitual thinking is another cost-contributor. When we say "let us do what we did last time", we generate unnecessary costs. We must guard against this very natural "short-cut" tendency. Today better (yet cheaper) materials may be available to carry out the prescribed function. For instance, the ball-type float made of copper of the yester year has now been replaced by plastic. The requirement of a particular function may simply have ceased to exist ; no point in continuing with it.

EMPHASIS ON FUNCTION

A customer buys a function, not the product. He may want in that function, the "use value" or the "esteem value" or both. Thus when you buy a car you buy transportation and prestige. The VA approach emphasises the function and does not initially concern itself with the structure or the part. The emphasis is firstly on identification of the required function and secondly on determination of the best way to perform it at a lower cost. This is where VA differs from all other cost reduction methods.

Value analysis can also be described as a "second look" at the material, design or process, to do the same thing in a better way—at a competitive price. In defining VA as the "second look" it is implied that the first look *was*, of course, taken and the designer had done *his* best to make his design as cost effective as possible. However, unnecessary costs do get in due to all those factors which I just mentioned. If "good design practice" in the design department or "good purchase practice" in the materials department were as common as one would have liked them to be, there might have been no need for VA. Howsoever desirable it may be to make the design fully cost-effective at the very first attempt, it has been found that it is usually not so in actual practice. But this does not mean that VA aims at redesigning the product ; it would be impertinant to do so. VA is not criticism of the original design but only its critical re-appraisal. Basically, it is sound common-sense put together in a systematic and sequential manner. One thing is certain. VA is not what one may term as "lowest tender". It does not aim at "cheapening" the product. It is also not VA if its application lowers the required performance standards or creates production delays.

A word about the terminology. Value analysis is a versatile management tool. It serves all branches of organisation—designing, procure-

ment, production and marketing, to name a few. For this reason, like many others, I also prefer the term "value analysis" to "value engineering" as it highlights its universal application. Looking at it this way, VA may be considered as an offshoot of work-study. There are people, however, who differentiate between these two terms. They say, "when this technique is applied at the design-concept stage, it results in cost prevention and should be called value engineering. When it is applied at a post-production stage or just before it i.e. at the final production model stage, it results in cost reduction and should be called value analysis as it is then really a postmortem of sort". Call it what you may ; its substance remains the same. In fact, now-a-days most people use these terms to mean the same thing.

COST REDUCTION—THE END RESULT OF VA

It would be no exaggeration to say that value analysis is synonymous with cost reduction. We simply cannot mention value analysis without thinking of costs. "Before-After" costs are the very parameters which enable us to measure the impact of value-analysis in terms of cost reduction. I am emphasising this aspect because it has been my experience that some people, for reasons not known, have held the view that cost data, even relative cost data, is not essential for value analysis. To my mind this is absurd. Value analysis study is not an academic exercise ; its final aim is cost reduction. How can the impact of a value analysis study be determined if "before-after" costs are not available ? Even apart from this all important objective, relative costs are required for identifying costly areas which are worthy of VA study. It is unwise to waste man-hours on comparatively inexpensive and unworthy areas. For all these reasons, a value analyst has to concern himself with costs.

VA WORTHY FIELDS

VA initially originated in a firm engaged in manufacturing electrical products, and its universal application was appreciated only afterwards. Relatively speaking, however, electronics circuitry offers less scope for VA than mechanical items. In the case of electronics equipment, therefore, it is the organic hardware and accessories that lend themselves more easily to VA scrutiny. Thumbing through the available mass of literature on VA case studies in the field of electronics, one finds that most of the work done in this regard has been associated with the hardware element of the equipment. By hardware, I mean the casing, the chassis, couplers, cable harnesses, connectors, electron tube shields, mountings, tags, switches and so on. The electronic components generally cover solid state devices, condensers and resistances. But there are also instances which show that

once the VA-worthy areas in electronics are located and cheaper feasible alternatives generated and implemented without delay, the savings are far more even in a single instance than those generated in the case of all the metal parts of the equipment put together.

Delay is dangerous in any VA study, only more so in the case of electronics where Change Proposals for alternative circuitry have, in the first instance, to be worked out in the form of mathematical figures. These, if found convincing, have to be translated into physical components. Unlike a piece of hardware, electronics are invisible. They can be verified only by their effect. While a VA Study Team can actually see in three dimensions the concrete hardware which they seek to study and change, they cannot see the abstract electronics except in mathematical form. Verification of even a small change in electronic circuitry or component can be a long-drawn-out and time-consuming affairs and in most cases likely to nullify the possible cost reduction benefits that may accrue from such a change. Further, any unwanted side effects on the system as a whole, which may result as a by-product of the change will only be apparent after the change is incorporated in the design. Now all this can be a costly and rather tiresome affair compared to the "see-while-you wait" facility offered by mechanical type of change. By contrast, the hardware associated with electronics, like any other hardware, lends itself easily to value analysis scrutiny. In my experience such hardware items have produced sizeable savings.

Let me now turn to the methodology of value analysis. The basic step in the VA methodology is the selection of products for value analysis. Any industry desirous of starting a VA programme has to face this problem.

PRODUCT SELECTION

There are several criteria for selection of the right type of product for value analysis. I shall mention a few.

Firstly, the product should preferably be at prototype stage i.e. the production model stage but not the bread-board stage. The design-concept stage, although an earlier stage in the production cycle, is relatively less remunerative from VA angle for the simple reason that idea generation from a two-dimensional blue-print is lot more difficult than from a three-dimensional prototype. It would certainly be nice to be able to foresee things at the earlier stage. But unfortunately it is not always possible to do so. It has been suggested by some people that VA should be applied at the stage when the basic specifications for the product are initially chalked out. The idea is good but not a practical one because the makers of the specifications are not in a position to know the "before-after" costs of

the various components of the product to be value-analysed at that early stage. They would not know the type of the component or the eventual source of its procurement. Only at a later stage, when the basic specification is translated into a design and manfacturing specification, it makes some sense to the production people. This is particularly true of electronics. I have mentioned earlier that electronics offer relatively less scope for VA than mechanical type of items. In the case of electronics, barring the original designer of the circuit, the other members of the VA team are not likely to know the circuit under scrutiny as intimately as the designer himself. If you consider the normal composition of any such team, you would see that the representatives of the purchase department, costing department and manufacturing department would not be able to contribute much at the design concept stage. It would be no exaggeration to say that even the technical members of the study group do not usually grasp all the aspects of the circuit under study at this early stage. When I say this, I mean that the members do not have, at that stage, sufficient understanding of the circuit from the *VA angle*, to be in a position to suggest cost effective alternatives. Consequently, generation of ideas regarding *cost-effective* alternatives becomes virtually impossible. For this reason, it is always a good practice to select a product which has assumed a concrete three-dimensional form as it greatly facilitates the exercising of the minds of all the members of the study group. Here is an example (see Illustration 2).

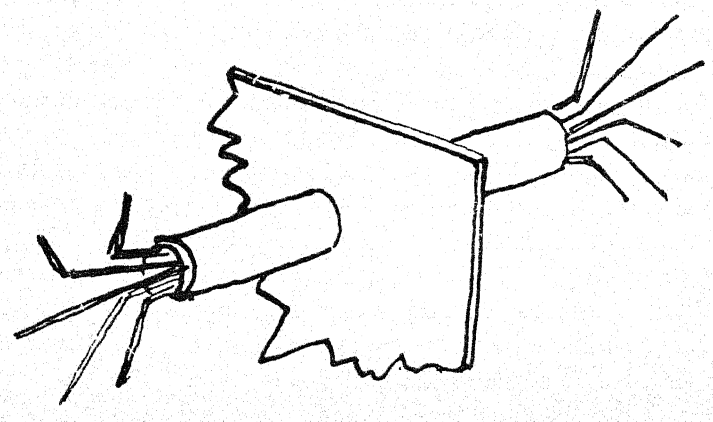


Illustration 2

In a certain equipment a cable-form consisting of a number of shielded wires passed from one side of the chassis to the other through a hole about half an inch in diameter. The wire was imported and quite expensive ; almost 100 meters were used in each equipment. When an indigenously available equivalent was suggested as the alternative, the designer initially turned down the idea on the ground that the indigenous equivalent was

slightly thicker (0·2 mm thicker) than the imported wire and, therefore, the cable-form could not pass through the hole made in the chassis for this purpose. The problem was solved when it was suggested to him that the hole could be made slightly bigger. A small idea but it indicated considerable amount of foreign exchange saving.

The second criterion for product selection is that the product should be fairly complex. Electronic equipment is almost always more complex in relation to the mechanical type of items. But within a given range of electronic products, choose the one which has more electro-mechanical complexities. Electronic equipment with a large hardware element in it is usually a good candidate for VA.

The third criterion for product selection is that the quantity required annually should be large if the product is inexpensive. However, in the case of expensive electronic products, small quantities may do if the tooling costs are not high.

Fourthly, a hastily developed product due to sudden emergent demands is usually an excellent VA candidate. Avoidable costs easily find their way in such products.

The fifth factor which must be taken into account while selecting the product is its VA implementability rating and hence the cost reduction potential of the product. This rating should be high. I shall not go into the method of computing the cost reduction potential. Suffice it to say that there is no point in choosing an otherwise good candidate and subjecting it to value analysis which may, in theory, indicate sizeable savings potential, if the probability of implementation of the VA recommendations is poor on account of one reason or the other. One possibility may be that, an account of the already-completed component-stocking action, the cost of implementation may be so prohibitively high that it could make the whole attempt not worthwhile. Another reason could be attributable to human psychology. The designer would fight tooth and nail to protect his "baby" from any changes that the value analyst may suggest ; it would be quite natural for him to resist the imposed change. If alternative material or component is recommended, the purchase manager too may put up stiff resistance; his plea could be that the alternative component or material is not available with his regular vendor whom he does not wish to displease for obvious or not so obvious reasons. All these human factors do play a substantial part in these matters and should be taken into account.

Any item which has been in use for a long time and whose specification has not been reviewed for years is likely to be a good VA candidate. In my work I have come across such items in the field of general stores viz., aluminium utensils, enamelware, drums and barrels and so on.

Finally, "collaboration products" are generally bad candidates for value analysis. The primary reason for this is that collaborators usually do not agree to any changes in their original specifications. Their guarantees become null and void if their specifications regarding materials, designs and processes are "tampered" with. Obviously, there can hardly be any scope for meaningful VA under these conditions. This factor will particularly apply to us so long as the practice of foreign collaboration continues in our country.

DATA COLLECTION

The next step in the VA methodology in data collection. Once the product is selected, all the relevant data regarding that product must be collected. The general data required is about the quantity on order, production schedule, estimate of repeat orders and so on. The technical data concerns the design and the manufacturing specifications. The details of manufacturing processes employed are not called for at this stage; these are required only in the case of the components or sub-assemblies selected for detailed VA scrutiny. Finally, the most essential data—the cost data—must be obtained. If the cost data is lacking or not true, there is no point in proceeding further. In the case of the electronic equipment of modular construction it may sometimes be more convenient to record the cost information function-wise rather than component-wise. It all depends on the form in which the cost information is available.

The third step in the VA methodology is the ABC type cost analysis. The cost data is used to identify the costly areas which are worthy of attention. It is an established fact that usually 20% of the components generally account for 80% of the cost of the equipment. These top 20% are the most VA-worthy components which should be earmarked for VA Study. The relative VA merit of the constituent components is determined by arranging them in the descending order of their total costs (and not unit costs). Thus even relatively cheaper items may be found to be value-worthy if their quantity happens to be substantially large.

Since the aim at this stage is to select VA-worthy areas, it is not essential to have absolute costs. Relative costs generally do. For this reason, it is unnecessary to breakdown the costs into their basic elements (variable element consisting of the cost of direct material, direct labour, direct transportation and fixed element consisting of the overheads such as rentals, electricity charges, taxes, ware housing, profits and so on). Exact costs are required at a later stage in respect of only those few items for which technically feasible alternatives are generated during VA Study.

As mentioned earlier, while considering complex products like elec-

tronic equipments, it is sometimes convenient to carry out a function-wise cost analysis. For example in the case of an HF communication receiver, the total cost may be broken down into function-wise costs of various individual units such as the RF chain, oscillator-mixer module, i.f. chain, detector—AVC—audio chain, power supply, connectors and panel controls and hardware structure. The highest cost area should then be given top priority for a value analysis.

The next step is "brain-storming" in which the "VA look" is not taken by one man who calls himself value analyst but by a group of men drawn from the various concerned departments. VA is founded on the principle of idea-generation by a group of people. Undoubtedly this basic VA approach can be challenged by saying that since the designer usually has assistants, there are more heads than one at the design stage itself. True, but it is an established fact that the designer and his mates are too close to their design to see their shortcomings from the VA angle and usually it takes a third independent party to notice the cost-effective aspects which escape the designer's eye. In these brain-storming sessions, the specifications are reviewed for over-insurance and over-provisioning and ideas on alternatives generated. Pointed questions are asked regarding the "function" and the other aspects of the item.

TYPICAL QUESTIONS

Some of the typical qustions which should be asked and answered at these sessions are as follows :—

(a) What is the "function" of this item ?

(b) Is this "function" prescribed and is it necessary ? Does it constitute over-insurance ? Can it be eliminated ?

(c) Does the item contribute in any way to the performance of the required function (If not eliminate the item itself).

(d) Does the specification prescribe any over-insurance ? If so, eliminate it. During the course of my work, I came across an example of such over insurance (see Illustration 3). A certain

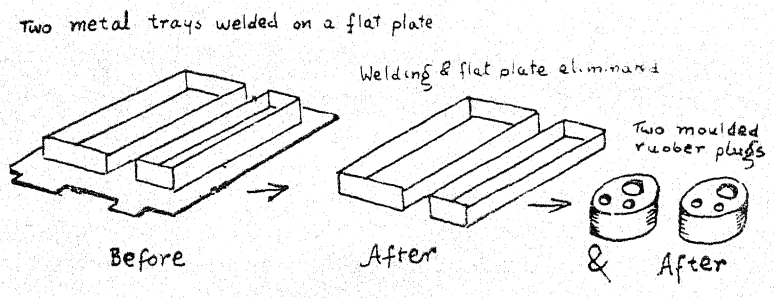


Illustration 3

electronic equipment was made up of two separate units. One of the units was mounted on the top of the other. Each unit had a power input socket with three pins, situated on its rear side. These pins were deep set and well below the panel frame thus affording adequate protection from damage during transit or storage. The designer had provided additional protection in the form of an assembly of two sheet metal trays welded on a flat metal plate. The trays which fitted the contour of the backs of the two units were separated by appropriate gap. During welding, care had to be taken to weld the trays exactly in place ; otherwise they would not fit. The cost of the assembly was Rs. 30/-. VA scrutiny revealed that there was no possibility of damage to the pins. However, since the designer had insisted upon some kind of additional protection various alternatives were considered. In the existing item the distance between the two trays was critical for proper fit. Bearing in mind the required function, two alternatives were generated.

(i) Two independent metal trays without welding them to a third flat metal plate. This removed the difficulty of proper fit and also reduced the cost by about Rs. 20/-.

(ii) A moulded rubber plug with holes to match the pins. These holes were to be smaller than the diameter of the pins to ensure snug fit. This was functionally better, yet cheaper of the two alternatives. The cost was Re. 1/- for two plugs. The savings per equipment was Rs. 29/-. Considering that the quantities on order were huge this VA change proposal indicated savings worth lakhs of rupees.

(e) Has the designer inadvertantly added to the cost by providing unnecessary facilities and accessories ? This sort of thing can and does happen (see Illustration 4). The 230 V AC output of

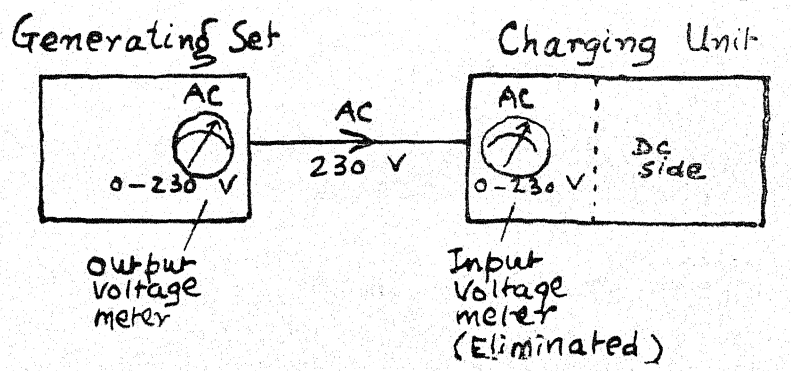


Illustration 4

certain generator was fed as an input to the accompanying charging unit. The DC output of the charging unit was then used for battery charging. The design specification called for a AC voltmeter not only in the generator's output circuit but in the charging unit's input circuit also. When the redundancy of such a meter in the input circuit of the charging unit was pointed out, Rs. 59/- was saved per equipment.

(f) Are "tailored" parts used where standard parts would do ?

(g) What is the cost of the function now, what else can achieve the same function and how much will that cost ? In one instance, review of the circuit design allowed substitution of a precision electromechanical high speed switch by a solid state electronic switch performing the same function at 67% less cost but with improved reliability.

(h) Is import substitution possible ? This aspect shall continue to be important in our country for many more years. An imported diode was being used in a certain equipment although its technical indigenous equivalent was available. The reason for doing so was that the imported diode had both the wires at one end and it could be plugged in vertically in a matching socket. The indigenous diode, on the other hand, had one wire at each end and could not, therefore, be plugged in vertically in the existing socket. Space limitation did not permit horizontal mounting. Brain-storming brought out that one of the wires could be inserted in an insulated sleeving, bent over and made parallel to the second wire which would facilitate plugging. A simple idea thus saved considerable foreign exchange (see Illustration 5).

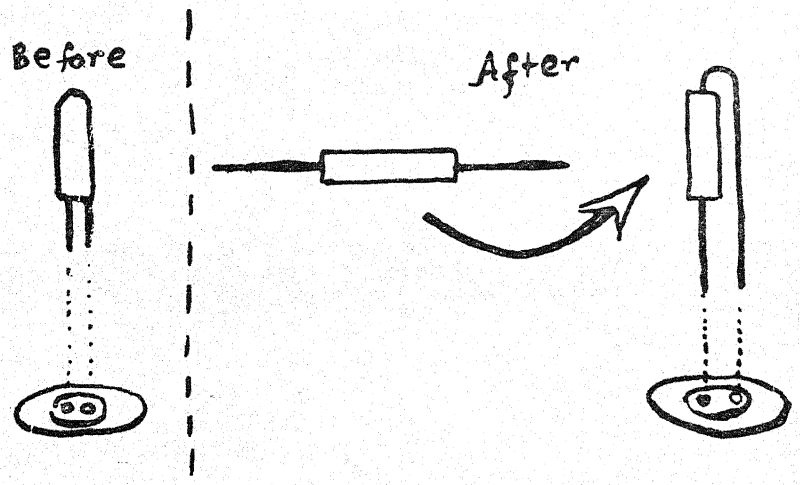


Illustration 5

(i) Is the material specified or used rare ? Or is it easily available ? When was it specified ? Have new materials been discovered since then ?

(j) Why not combine uses ? Can a part designed for some other product of the Company be used in this product ?

VA IS NOT A DOGMA

Most VA concepts are so basic that they should be a part and parcel of the thinking, approach and conduct of anyone engaged in any activity, technical or otherwise. One apprehension that one may, therefore, possibly have against VA, like any of its sister systems, is the growth of a professional priest-like class practising the particular system. Such a class tends to render the system unpracticable by anyone other than themselves by not allowing the basic concepts to remain the simple tools which they are and which every worker in the concerned field of activity should himself be able to, and must, use for achieving improvement. But it is also my view that if you are to drive full benefits from VA, you cannot treat it as a "side business". The VA approach has to be a deliberate effort which demands single-mindedness of purpose ; part-time attention is almost always ineffective and therefore wasteful.

I shall not discuss the full details of the remaining steps in the VA methodology because they are too straightforward to warrant amplification. I highlighted the first three steps regarding the acquisition of meaningful data (including the cost data), its methodical analysis and the idea generation sessions because they are the basic steps without which no value analysis study can proceed. To complete the picture, however, I shall merely mention the remaining steps in their proper sequence. These are :—

(a) Preliminary selection of the technically feasible alternatives. This is the outcome of the brain-storming.

(b) Cost-wise ranking of these alternatives and selection of the most economical one or two of these.

(c) Verification of the chosen alternatives by actual trials in the specified environment. In the telecommunication field, trials are almost always necessary. In the other fields they can often be dispensed with especially when it is obvious that the chosen alternative is workable.

(d) Final selection of the best alternative i.e. the most cost-effective, yet satisfying the required standards of performance, especially in quality, reliability and maintainability.

(e) Estimation of the costs of verification, implementation and the VA study itself.

(f) Preparation and submission of the Value Analysis Change Proposal (VACP) to the authority ordering the VA Study. This VACP should clearly but concisely bring out the function and the cost in the "before-after" format indicating the nett VA saving with due regard to the verification and implementation costs, the study cost and the quantity of the equipment to which the Change Proposal can be applied. (See Illustration 6, Page 287).

Although strictly speaking it is not the function of the VA manager to implement the VACP, he should accelerate its implementation, for, VA benefits have a tendency to reduce with the passage of time. As the days go by without any implementation action, the product progresses further on the production cycle and unless quick follow-up action is maintained, it may even reach the production stage when it is too late to do anything about it. Another reason why VA people should keep a track of the result of their work is to learn from their mistakes and to improve upon their work. This task becomes simpler in an organisation where feed-back generation is a standard drill.

CONCLUSION

In this article I have skipped over the following aspects of value analysis :—

(a) Organising a value analysis department without making an empire out of it.
(b) The composition of value analysis team and its placement in an organisation.
(c) Starting a value analysis programme.
(d) Creation of a data bank in the VA department.
(e) VA training.
(f) Sharing of VA benefits and contractual aspects.

I shall end this article by quoting some facts and figures from the work done by my Study Groups. But before I do so, I wish to stress this : Let it be remembered that at present ours is still the only *organised* value engineering effort, not only in the Army, not only in the Defence Services, but in the whole country. We have had and still continue to have our successes punctuated with failures. In spite of best efforts, what we sometimes do or have to do cannot really be called value engineering at all. But like any new venture, ours is a pioneers' trail. Therefore, those who take over from us would find most of the spade work already done for them. Out of the seven studies undertaken during the last two years, one was an absolute non-starter and two were partially and three fully successful. The study currently in hand appears to be promising and has already yielded Rs. 1,11,000 *annual* savings. The total one-time savings run into Rs. 21,85,351. All these are real savings, not on paper only. A further potential of real savings worth Rs. 14,89,656 has been indicated but it is still under discussion. The fish that got away, however, was a large one ; it "weighed" almost Rs. 3 crores !

ILLUSTRATION 6

Value Analysis Change Proposal (VACP)

(**Note** :—*Only some of the typical headings are given here.*)

1. Authority for VE Study :
2. VACP serial number :
3. Name of the main equipment/product and its identification number :
4. Name of the subject item/component/sub assembly and its identification number :
5. Governing specification :
6. Function of the subject item (with brief description, if necessary) :
7. Brief description of the Change Proposal :
8. "Before-after" sketch/circuit/photograph of the item with costs :

Before	*After*

9. Saving per unit :
10. Quantity affected by VACP :
11. Costs of verification and implementation :
12. Net savings :
13. Recommendation by the Study Group regarding implementation by all concerned :
14. Composition of the Study Group :—
    (a) Convenor/Coordinator :
    (b) Members :

Signature of the Convenor

15-17. Approved : (specific written reasons to be given if not approved)

Signatures of the concerned departments officials.

18. Implementation orders by the decision-making authority who ordered the VA Study :

Signature of the authority ordering VA Study

DESERT WARFARE IN OUR CONTEXT

BRIGADIER SURINDER HARSH

INTRODUCTION

Field Marshal Wavell once compared the tactics of war in the desert to war at sea. Freedom of manoeuvre enjoyed therein was proportionate to the vision of the leader and resources that may be available to him. Equipment which gave any superiority in mobility and fire-power counted for much in war in the open desert, with its independence of fixed defences. Rapid and wide manoeuvre, and superiority in gun-power and armour, were the best methods to win battles, states Montgomery of Alamein (History of warfare). Armour reins supreme in desert warfare provided the tank man keeps forging forward relentlessly. This aspect has been sufficiently proved during the 1967 war in the Sinai desert by Israel.

The Indian Army, where infantry is the predominant arm, is basically governed by infantry tactics. In this paper emphasis is laid on the study of infantry actions in the desert with other arms generally playing the support role. Our present tactical concepts in the desert should be so modified as to allow better scope for mobile warfare by the infantry supported by armour, as opposed to the positional warfare. Infantry should also be prepared to undertake major tasks in support of predominantly armoured formations. Rapid and wide manoeuvre should be common place occurences for our infantry. This study shall have bias on Infantry tactics at brigade and lower level.

THE vastness of desert is interspersed with sand dunes varying in height from 50 to 150 feet. These sand-dunes generally lie from south-west to north-east with slopes being gradual in the SW and almost sheer drops in the NE. Accordingly assault over NE slopes by infantry is hazardous. Tanks and even one-ton 4x4 vehicles can be moved to the upper reaches of these sand dunes over the SW spurs. The lie of sand-dunes is primarily due to the reasons of wind direction. The valleys between dunes are long and narrow and can in many areas, permit movement of light vehicles barring a stretch of heavy sand tract in one or two areas. Direction keeping through these valleys is difficult since most sand-dunes look alike. There is hardly any vegetation on these dunes except during the rainy season. Camouflage and concealment thus acquire greater importance. It is an ideal country for camel transport.

In places the desert is strewn with big, rocky and bare features with steep gradients assaultable only by infantry with many restrictions. No vehicle of any type can negotiate these features. In many places these features can be bypassed.

Extremes of weather conditions prevail for most part of the year. During summer day-temperature touches 120F, though nights are generally pleasant and bright. The countryside is thus most suited for night operations. Winter nights can be exceedingly cold—sometimes lower than freezing point—and cut down efficiency considerably unless troops are suitably clothed. Feet in ammunition boots get the roughest time when operating for long hours during winter nights. Lining of footwear, for winter night use only, thus becomes imperative. Perpetual duststorms during February to May make the mechanism of weapons difficult to manipulate. Use of dust proof goggles is advisable, for otherwise prolonged effect of sand, dust and glare causes eye ailments. Heat, dust and stress of desert driving cut down the life of vehicles considerably, necessitating scaling of divisional ordnance maintenance companies accordingly. Preservation of foodstuff is yet another major problem for garrisons which are required to fight in isolation for some length of time. Holding of reserve of drinking water in underground reservoirs and their replenishment are tasks peculiar to the desert.

Rains are scanty and in certain areas there are no rains for a consecutive number of years. Famine conditions are a regular feature in some desert tracts. Every ounce of food is, therefore, to be imported into those areas for the maintenance of operating troops. Most areas are sparsely populated by sturdy and robust people. They are proud of their environments and possess great insight and skill to use the ground to their advantage. They can travel almost 50 to 60 KM by night with the help of stars using riding camels and without aids such as compasses.

LAND COMMUNICATIONS AND WATER RESOURCES

Cross-country tactical movements are generally possible with suitable transport though sustained maintenance can be assured only over well-maintained roads and tracks or by air. Movement of large formations—especially their headquarters—are restricted to black-top or gravel roads though the latter get corrugated soon enough. These roads and tracks have limited trees and hardly enough shade. Tactical hides are scarce and locations of vehicle fleet are easy to spot from air unless adequate camouflage, concealment and track discipline are ensured. To allow switch-over of the forces the limited communication centres thus become imperative.

Since there are only limited roads and tracks the frequency and intensity of vehicular traffic can lead the enemy to guess the general direction and nature of impending operation. Cover plans apart, the necessity for cross-country capability of formations is more relevant. Roads and tracks should, therefore, be relied upon for sustained traffic for logistics and totally ruled out for tactical moves.

Water resources govern the nature and extent of operations in the desert. Scarcity of drinking water resources results in long carriage of this commodity, absorbing a good percentage of available vehicle fleet, or by laying water pipe, where tactical requirements may so dictate. Tube-wells and in certain restricted areas perennial canal water may be available. Even the best available water has a higher percentage of chloride content, though within tolerable limits. Carriage of water in specially arranged containers is a great limiting factor and tactical plans are, perforce, to be tailored accordingly. Locals use pond water. In a number of cases this source results in diseases such as guineaworm and hookworm. Water discipline and imposition of restrictions on scale of drinking water are therefore inescapable. Water sources, in the desert thus become a bone of contention with the enemy and have to be defended or denied. This denial of water to the enemy, within an easy reach, will stretch his logistic means affecting tactical plans. Field Marshal Allenby's advance in the Palestine Campaign, during World War I, had to be slowed down since the horse cavalry had to be withdrawn for watering. To obviate such handicaps, even for a limited period, suitable and sufficient carrying agencies will have to be provided to troops for water in the desert.

TACTICAL CONCEPTS

Rommel's favourite tactics was to induce the British tanks to attack his armour which he protected by a screen of anti-tank guns; he thus knocked out most of the British Armour—having done which he launched his own armour and won the melee.

The Russians basically follow the system of 'Linear Dispositions' designed to defend and block the axes of advance bordered on both sides by obstacles—natural and artificial—like minefields. Linear disposition is not a single line but extends in depth and consists of three main sectors—

(a) **Forward defence line**
Where the main fighting force and weapons are assembled;

(b) **A deep rare defence line**
Which serves as a second holding line if the first is overrun, and

also, as a base for counter-attacks in support of the forward line;

(c) Anti-tank locality

Between the forward and rear lines is the anti-tank locality, which contains men and weapons—mostly tank and anti-tank guns—whose task it is to destroy whatever forces penetrate the lines and to provide covering fire.

The basic strength of this defence system is that it cannot beoutflanked. Any force attacking such a disposition is obliged to attempt a frontal assault advancing through main fields of fire of the defender. And even if it gets through the First Lines, although inevitably weakened by the assault, the anti-tank locality still awaits it. And if it overcomes that obstacle, there is still the rear line to deal with. This system of defences was adopted by the Egyptians during the 1967 war against Israel. Though the Egyptians fought fairly well, the system collapsed sooner than expected. One of the main reasons apparently was the ill-designed use of armour—more as pill-boxes than tanks, and their crews were not as well trained to react spontaneously to a developing situation. Though the Egyptians used over 950 tanks in the melee, at no stage did they effect local superiority anywhere which the Israelis always managed due to mobility and better leadership.

The other situation can be where both sides are basically dependent on infantry with armour and other arms in support. In such a case an infantry brigade group may be earmarked to block a given axis. A study of the likely pattern of the enemy's infantry attack may help to suitably organise our defences. The enemy is likely to move from one water source to another. The defender should therefore hold and deny areas dominating the contended water source. As a result, the defences may generally be organised over a complex of sand-dunes dominating the water source. Such may be the case in respect of important communication centres as well.

By-passing any defended sector or area is tactically possible in the desert in most places. But opening of the axis is essential for sustained traffic for maintenance. The defender has therefore to act tough by holding out, organising strong raids and ambushes against the enemy's temporary line of communication and denying water sources within reasonable distance. The bulk of attack against a defended sector/area would, as a rule, be from any one direction, while representative forces with preponderance of automatic weapons may be launched from other likely approaches to simulate the directions of attack. In such a case it becomes increasingly

difficult for the defender to determine the real direction of main attack since most attacks in this terrain are better launched at night.

As a result of the above the following emerge:—

(a) Information regarding direction of main attack when defended sector/area has been contacted

(i) To forestall enemy action, earliest possible information regarding his direction of main attack is imperative. In the given terrain, therefore, OPs/LPs (Observation Post/Listening Post) need to be positioned approximately 2500 to 3000 metres away covering all possible approaches. These OPs/LPs should be located suitably to overlook the likely assembly areas of the enemy. Necessarily these positions should be changed both by day and night and no position ought to be occupied for more than a couple of days. These positions should be provided with sound power telephones directly connected to the battalion command post. Suitable and light radio sets should also be provided as alternative means of communication. These OPs/LPs should be commanded by enterprising young NCOs who are able to assess the threat coolly and correctly and accordingly pass the information back earliest.

(ii) A series of fighting patrols should operate approximately 500 metres behind the OP/LP locations to deny information, to offset the enemy during his approach from assembly area to Forming Up Place (FUP), gain information regarding direction of main attack and to provide protection to OPs/LPs since they are stretched so far out. Young and promising Junior leaders should normally be assigned to these tasks.

(b) False frontages

A few platoon localities should be established outside the defended area proper but within one thousand metres of the actual forward defended posts. Such localities should cover all likely approaches and should have the same standard of defences as for the actual defended areas. Routes should be selected and practices carried out for these platoons to fall back. The order for them to pull out should be given by the bde/battalion Commander since he would have a clearer overall picture of the situation in hand. The best time for them to withdraw would be as the enemy approaches the assault line (not the start line)

or a little earlier. Prior to this the given locality is likely to be under enemy artillery fire and movement at that stage may result in heavy casualties.

(c) **Organisation of defended Areas/Sector**

Suitable and adequate positions need be prepared to cover each approach. Thereafter two-third force be deployed to hold the defences while the remaining one-third be kept in reserve. Armour, Ad hoc Recce and Support Platoon of the battalion (one section MMGs, one section RCLs—though section of infantry mortars should not accompany in this case) along with an infantry company and adequate artillery fire support be so held outside the defended area that it can be launched in a spoiling attack. Unit Second-in-Command or the armoured Squadron Commander may be placed in command of this force. The spoiling attack should be launched while the enemy is in the FUP. These tactical concepts should form part of battle drills to achieve speedy results during the fluid stages of the battle.

Such an aggressive posture is imperative during defence to seize the initiative from the enemy. To meet all the above requirements adequately the fighting strength of units in the desert needs to be boosted. Formation of Recce and Support Platoons and Commando Platoons at battalion level are inescapable requirements. Their roles will be discussed again during attack operation. Detailed examination of these latter issues forms part of a separate study.

NO REMOTE CONTROL

Desert warfare is not suited for remote control. Clear-cut instructions laying down the larger aims should be passed down to requisite levels so that commanders at their level could pursue the given aim in face of developing situations without having to look over the shoulder.

The Israelis followed the principle of "rapid mobility in depth" using armour. The result of this tactical concept was that a large number of tanks appeared in depth in areas where they were least expected. The effect of such a move is that infantry men preparing positions in depth are caught unawares and unprepared by assaulting tanks bearing down on them. Obviously such armoured columns have to be strong and duly provided with air support. Their equally mobile supporting infantry follows at their heels. Such tactical moves require daring in planning and execu-

tion. Undue emphasis on security and administration cannot produce the desired results. During such operations tank columns are better led by leaders standing in their tank cupolas and overcoming quickly the situations as they arise. Good standard of tank gunnery and spontaneous reactions by tank crews help destroying targets coming to life instantaneously in the alien territory not patrolled by own troops. The planner needs to select suitable objectives within reasonable reach of his forces. Objectives like Alam Halfa can hardly be won over through threat of manoeuvre alone.

Conversely, another situation can be where both sides have preponderance of infantry with limited armour in support. In such a situation an infantry brigade group may be launched in pursuance of the principle of 'rapid mobility in depth'. Advance along limited roads and tracks would generally be hazardous since its pattern is easily revealed over desolate countryside where tactical hide-outs are limited. Enemy delaying positions gain the time required, forcing a series of battles. Such military manual advances are sure to fail in the desert terrain. Advance by night by a brigade column along a given axis is a far-fetched idea. In the desert, therefore, it would be profitable for a brigade group to move across country by battalion group columns covering 50 to 70 KM in a night and hit the enemy, where he least expected it, within an hour or two of the first light. The accompanying artillery should be ready to provide fire support. The targets in this case may have to be treated as immediate neutralization shoots. In view of the experience gained it can be suggested that 120 mm mortars with improved range are more profitable for such tasks since they can be transported easily across country, have better rate of fire, greater lethal zone and larger zone of fire. Adequate fighter bomber sorties should also be allotted to this Strike Brigade ('S' Brigade) to compensate for the lack of artillery fire as also to punish enemy armour placed in support of the selected objective. The technique of attack is discussed later. Own armour should be hurried at tank light along the route followed by 'S' Brigade to join its formation. Armed helicopter protection may be necessary as also some infantry. It has been experienced that the noise of vehicles, even at night, gets absorbed in the vastness of sand and it can only be detected when they reach fairly close.

MOBILE COLUMN

A commander, who decides to approach and strike at the possible vitals of the enemy as suggested above, shall need to earmark a suitable force to clear the axis by resuming advance along the main axis at the given time during very early hours of the day of attack by 'S' Brigade. This force too should resort to manoeuvre tactics allowing a strong mobile column to advance on a flank approximately four to five kilometres away

from the main axis. This column should establish a road block in the rear of the enemy, the fear of being cut off should hasten the enemy's pace of withdrawal.

'S' Brigade could either advance astride the main axis, keeping eight to ten kilometres away on each flank, or else it could move along any one flank leaving at different timings maintaining an interval of two to three kilometres between the given compass bearings of each battalion group. There are obvious advantages and disadvantages for the above courses and calculated risks may depend upon the state of enemy's morale and fighting ability. It may be desirable for 'S' Brigade to despatch a group of brigade ad hoc Commando Company, and Recce and Support Company (both companies formed by pooling all battalions respective platoons) commanded by enterprising officers. For ease of reference call this 'Force Charlie'. This force should lie low during the following day and only recce patrols commanded by young leaders, be sent out to study the general layout of enemy defences. This information would be of immense help to the 'S' Brigade Commander who may get only limited time for the purpose on the morning of attack. Obviously outline plans and preliminary orders for attack will have been given prior to the start of flanking move, with the aid of air photos and other intelligence reports.

The aids for advance by night in vehicles and the drills to overcome obstacles speedily, forms part of a separate study. A proportion of vehicles of each column need to be fitted with special lights, if infra-red or ultra-violet lights cannot be spared for the purpose. Gyro Compasses need to be mounted in Commander's vehicles (Company Commander and upwards). Even our GS Compasses are adequately suitable as an interim measure. On a given bearing, error remains constant for vehicle bearing (a bearing taken with compass from inside a given vehicle—this error will differ from vehicle to vehicle—). To achieve better results no leg should be more than 10 to 15 KMs and each leg should be checked against some prominent land mark given on the map and ground. All drills have to be well-thought-out and practised during training.

The success of such an operation largely depends upon the state of radio communications enjoyed by the force. Short and snappy transmissions with due care for security need emphasis. The standard of training in radio telephony in the infantry need marked improvement. The present equipment suffers from weight and bulk. The power batteries are cumbersome and do not hold charge for long enough. Due to heat, evaporation and spill-over during cross-country moves, loss of electrolite results, creating a need for more distilled water and acid. There is thus a requirement for light, powerful and sturdy transistorised radio-sets where powerful

dry batteries should be used rechargeable like the camera flash battery, but of a better version. Most rover vehicles fail to join their commanders since they are loaded with heavy radio stations. This failing needs to be put right.

ATTACK

Field Marshal Allenby's capture of Gaza was suggestive of the fact that rather than head-on collisions against prepared positions, attacks resulting from wide manoeuvres were more feasible. Lately, Israel proved that daylight break-through by armour was also possible provided complete surprise could be sprung for the massive attacks being launched. Three Israeli armoured divisions broke through Egyptian defences organised on the system of linear dispositions. The Egyptians had organised the Sinai defences by deploying five divisions, approximately 950 tanks and sufficient artillery of different calibres. The Israeli armour forged through with such fantastic rapidity and originality that many depth positions of the Egyptians were caught completely unawares. There was a display of sound leadership at all levels. History also notes cautious and deliberate moves by Montgomery to pursue Rommel after the battle of Alamein. Apparently the ability of the opponent to muster a come-back had to be borne in mind by the commanders concerned, though the degree of it is the latter's own evaluation.

LIMITED ARMOUR

Another situation can be when both sides enjoy preponderance of infantry with limited armour in support. In such a case an infantry brigade group may be launched to attack a given system of defences. As discussed earlier, the defender has generally to resort to extended fronts in the desert, covering gaps and the given ground by integrated fire of weapons. The attacker should aim to neutralise, silence and destroy those weapons avoiding, where possible, entry into the main killing areas of the enemy. Apparently therefore, most infantry attacks may have to be launched from the direction of the enemy's rear or as near to it as possible.

The two serious adversaries sited outside the defended area proper are, the reserves earmarked to launch a spoiling attack and the enemy guns providing fire support. Depending upon the capability of the guns, these may be located approximately 2000 to 2500 metres in the rear of the enemy's defended area. The reserves may likewise be located some distance away from the gun area to avoid punishment during counter-bombardment of their guns by the attacker. Their actual positions should, as far as possible, be located and likely routes for their action to our planned FUP be determined.

Force Charlie, as discussed earlier (Commando Company and Recce and Support Company of the 'S' Brigade), should be launched against the enemy gun area approximately an hour prior to 'H' hour. This raid may continue for ten to fifteen minutes using MMGs, RCLs and Commandoes. Having incapacitated enemy guns 'Force Charlie' should rush to the pre-selected ambush site (site between the proposed FUP of own troops and the known location of enemy's reserves) to foil the enemy's ability to launch a spoiling attack while own troops are in FUP or moving from it towards their objectives. Speedy execution of such a plan can only be promised if participating troops are suitably trained and junior leadership is enterprising enough. Such tasks could also be carried out by helicopter-borne troops. Their launching has obvious drawbacks such as dependence of air superiority, weather conditions and lack of carrying capacity for anti-tank weapons and transport. Of course, availability of helicopters shall be the primary consideration in our case.

The technique of main attack is no different to the recognised concept for this operation—crumbling actions. The distinct advantages in this case are the direction of attack, its time and selection of objectives—generally starting with the depth localities avoiding main fields of fire of the defender. Due to it and since surprise is achieved, the attacker may take calculated risks to gain full advantage of the situation. It will be imperative hereafter to maintain the momentum relentlessly to the limit of logistic support.

LOGISTICS

To carry out the tasks envisaged above, better troop-carriers and transport are required. Their cross-country performance and improved radius of action are inescapable requirements. Half track vehicle with armour protection could be an ideal mode of troop-carrier in the desert though the initial prohibitive outlay and maintenance cost may not find approval as yet. Their procurement and foreign exchange requirements may not sufficiently justify their immediate introduction in the desert. Alternatively, equally effective vehicle should be a low silhouetted 6x6 drive (three axles with independent drive for each wheel enabling to pull out the wheel stuck in sand), fitted with balloon type sand tyres and with a capacity to carry tactical load of half of an infantry platoon. Cost production and consumption of fuel should be comparatively less. Indigenous production is possible. This vehicle could also be used as load carrier. In fact some such last war vintage vehicles may still be available in our army today. These could be fitted up properly and tried out in the desert. Till this vehicle is introduced the present one-ton Nissan fitted with suitable

tyres should be good enough though the length of column would become avoidably long.

Wear and tear on transport operating in the desert is immense. The life of vehicles is thus proportionately reduced. There is apparently a requirement for better system of maintenance as opposed to the present way of employing the hard-pressed driver to go through the motions of maintenance. Condition of vehicle fleet and its battle-worthiness can be assured if "Mobile Maintenance Stations" were established on the recommendations of a "Work Study Team". Provisioning of spare parts for vehicles, guns and other weapons need review and divisional Ordnance Maintenance Companies (OMC) should accordingly be scaled. "Mobile Repair Teams" should be introduced to execute on the spot repairs where possible, to improve the standard of road-worthiness of transport of units and formations in the forward areas.

Due to emphasis on manoeuvre the requirements of gas and lubricants proportionately increase while ammunition expenditure is reduced. Jerry cans—the best petrol containers—need to be arranged in requisite numbers. Carry forward and delivery system of POL need examination. Light petrol tankers with mechanical system to fill up other vehicle tanks may be useful as part of 'B' Echelon transport of an infantry battalion in the desert.

Lack of water sources, carriage of water and containers required therefore, manifestly add upto the logistic problems. Hard scales are all right for a limited period, for otherwise, they tell on the efficiency of troops. Three to five litres of water per man per day is adequate for drinking and cooking purposes for a limited period, but cannot provide a bath which may be necessary once or twice a week depending on weather conditions. Even at the above scale an infantry battalion alone will need 4000 litres of water as one fill while the second fill is being arranged. If 1000 litres go for the refilling of water bottles for the unit personnel, containers for the remaining 3000 litres of the first fill are still required. In terms of Jerry cans it means 150. This requirement can be worked out at brigade group and divisional level. Filling-up of containers from water trucks is a time-consuming factor and it is for consideration whether the first echelon containers be filled in the FDLs (forward defended localities) or second echelon containers, filled in B echelon areas, be sent for a clean exchange. During fast-moving battles filled containers will have to be sent up for clean exchange, whereas in defence the requirement for containers for General Staff holdings of water will be over and above the maintenance requirements. The planning conferences should, therefore, lay down suit-

able priorities on all such matters since a good percentage of vehicle fleet may be tied up for water duties alone. Timely availability of containers will largely depend on the anticipatory actions of 'Q' staff. The present 'Jerry can' and barrels, though sturdy as water carriers, are too heavy and bulky even when empty. Suitable light material should be used for water containers ensuring durability and avoidance of loss of water through seepage or spilling over. Likewise the water carrier should be a low silhouetted 6 x 6 (three axle) vehicle with arrengements for mechanical fill and discharge. The available 4 x 4 water vehicle is incapable of good cross-country performance in the desert.

FOODSTUFFS

Varieties of canned foodstuffs should be catered for in addition to the presently emphasised potatoes and peas. Firewood is difficult to come by locally and the present contraption in the shape of oil cooker is rather bulky, needing a continuous supply of cooking fuel. It is for consideration whether cooked canned Indian dishes could not be provided to troops operating well up in the desert. Time allowing, the same could be warmed up. This would reduce cooking fuel loads considerably. Requirements of water for cooking purposes will have reduced proportionately.

The present bulky oil cookers need to be replaced. Solid fuels should cut down the present scales of liquid cooking fuels. Defence laboratories should be assigned such tasks. Requirements of transport and containers for fuel can thus be cut down accordingly.

Apart from the employment of helicopters for casualty evacuation there is greater need to train more male nursing staff who should accompany, in pairs or threes, any reasonable size column. This is important since doctors have to be employed on more important tasks in the Mobile Section hospitals or Regimental Aid Posts and on the spot attendance of serious battle casualties could be an imperative task for these nursing staff.

To combat the rigours of desert, familiarisation with the countryside is imperative. Desert lore during different seasons should be aimed at. Introduction to the desert tracts should be gradual and if possible, be initiated during favourable weather. The tempo of training should be increased as time passes and towards the end it should be stretched to the outside limit of tolerance of participating troops. Of course the leader and his troops should undergo equal strains. Austere habits are more helpful since a chance to live off the land is possible only for small parties and for a limited period.

Direction keeping is a major problem, both by day and night. Through well planned and strictly supervised training and usage, directional senses gradually get adjusted. It may sound ridiculous but I have known of officers spending hours after dinner to locate their living bunkers within 100 metres of their underground field messes. Training and living with the desert conditions give great confidence. As stated earlier, battalion group columns have been able to cover 50 to 70 KM by night moving across country in vehicles over the desert terrain. Attacks, as described above, were launched within two hours of first light.

Proficiency in handling of weapons and confidence to shoot down the enemy at comparatively longer ranges are imperative requirements. Anticipation and spontaneous action need to be ensured through practical and progressive training. Equally important, in the desert, is the training for drivers. No matter how powerful and suitable a vehicle is, its efficiency largely depends upon the standard of its driver. Use of power and auxiliary gears cannot, and generally never, make for the poor standard of drivers. Systematic training in driving both by day and night, in the desert tracts is essential. Here is a case to review the trades of infantry drivers for without their efficiency the combat columns may never reach their objective in time moving across country at night.

TRAINING CELLS

A general tendency of positional warfare attitude, which has crept in due possibly to the commitments in the mountains, needs to be corrected while fighting in the desert. This exercise of two different attitudes needs to be given due importance in our schools of instruction. Mobility, surprise and night warfare should remain the core of principles born of present scarcity. We should aim and insist on the tactics of "Rapid mobility in depth." Desert warfare may possibly receive more attention in the not too distant future when the strategists see the threat imposed by the nature of procurement and shopping bills of the adversary. Emphasis on predominance of armour by the opponent is unlikely to be with the intent of a repeat action in the previously contended terrain now full of anti-tank obstacles on either side. Sights may already be adjusted on a suitable landscape for the purpose. Strategic surprise by enemy should be permitted no quarter during planning. Last-minute switching over of major formations from one to another totally different terrain cannot, understandably, fetch up the best results. Experience should be the guide for the future. Since military preparations, including training, take time, focus on these can be laid now. Infantry and Armoured Corps training schools may do well to expand their mini-training cells dealing with Desert Warfare. These

cells should be closely linked with the Desert formations during annual manoeuvres. New concepts and battle drills should be closely linked with the Desert formations during annual manoeuvres. New concepts and battle drills should be put to the litmus paper test in the desert. Junior leadership (Senior NCOs upwards) should receive their training in theory in these schools and then be sent for eight weeks to a desert formation where a unit should be earmarked for the training of such leaders.

Training must remain progressive factually and not as a mere slogan. The concept of use of armour in Israel prior to 1956 was perhaps vague. This fact is illustrated by the following incidence. General Moshe Dayan was Chief of Staff during 1956. Infantry and paratroopers held the decisive combat role. During the preliminary planning stages of the 1956 Sinai Campaign, General Dayan had visualized the tanks being conveyed on tanks transporters in the wake of charging infantry units, while their crews travelled behind them in buses (Shabatai Teveth's 'The Tanks Of Tammug', page 12 para 3). And yet the same Israelis so quickly masterminded the tank warfare in the desert to such fantastic standards that during the 1967 war, one of their armoured formations advanced seventy kilometres within the first twenty-four hours, breaking through five heavily fortified and defended sectors, destroying six enemy brigades in the process. Original concepts and progressive training have obviously a major role to play to promise such successes.

Before we conclude, one more aspect could be given due weightage. Teams of military experts should examine how far a first-hand study of the current warfare of outside armies would be beneficial to our junior and senior leadership. Such study teams should be permitted similar facilities as are available to scores of our civilian counterparts who visit other countries to study their systems and methods of overcoming economic, technical and social problems. Likewise it should be possible to attach our teams of junior and senior leaders to outside armies where experience in desert warfare, as also other types of warfare, has been gained in the wake of a series of wars.

AIR MOBILE DIVISION —THE DIVISION OF EIGHTIES

LIEUT COLONEL MS VIRK

"HISTORY has reinforced my conviction that major advances in the art of warfare have grown from Fullers and Guderians—men who detected in the slow, clumsy, under-armed, largely ineffective tanks of World War I the seeds of the future....More recently Generals Hamilton H. Howze, Earle C Wheeler....conceived air mobility long before the machinery existed to fulfil the concept"—General William C. Westmoreland, Chief of Staff, US Army.

Talking of Ist Air Cavalry Division (Airmobile) of the US Army, General Westmoreland said "For the first time an Army unit of a division size had been organised and equipped to free itself from the construction of terrain through the use of air mobility. The concept and resultant organisation of the air mobile division were logical outgrowths of the development of sturdy, reliable helicopters....".

The air mobile concept and the air mobile division have been adequately proved effective, in Vietnam, to merit our consideration. General Wheeler, US Army, Chairman of the Joint Chiefs of Staff, who had not been particularly enthused over the idea of an air mobile division was so impressed by its performance in Vietnam that he said, "In my judgment the introduction of air mobile concepts....has put back into the military arsenal a capability which went out with the disappearance of horse cavalry. Do not misunderstand me, I was never a horse cavalryman, and I do not yearn for the return of the horse, but it is quite true the horse gave you a capability which, when lost, was never recreated until we got helicopters and are using them the way we are using them now".

The protagonists of armoured and mechanised formations may raise their brows at General Wheeler's comparison of the horse, and neither a tank nor APC, with the helicopter. General Fuller had forecast normal tank moves of 200 miles a day. Similarly the US Army officially maintained that average mechanised movements would exceed 150 miles per day, under pressure. But a study of various movements—tank and mechanised—during World War II, indicates these were rather ambitious targets. Military historians agree that Rommel's advance on 17 June 1940 towards

Cherbourg "far exceeded any day's advance in the history of warfare". Though the leading elements had advanced almost 150 miles on the first day, the division managed to close up on the following day, thus averaging 75 miles a day. In Libya, during 1942, Rommel's mechanised force averaged 60 miles a day. The figures for the daily movements carried out by other formations, during World War II, vary between 14.7 miles and 32 miles. Sabutai in Hungary in 1241 and Allenby in Palestine, 1918, averaged 60 miles a day with their forces based on horses. It is obvious tank and mechanised forces did not adequately replace the horse—due to the inherent limitations.

Nearer home a study of our operations during the Indo-Pak wars of 1965 and 1971 will indicate that our divisions could hardly move except in Bangladesh, where the circumstances for war were quite different—and may not be encountered again. It is quite likely in some cases strategic considerations may have restricted our movements, while in others the nature of terrain, particularly obstacles like canals and bunds, and well-coordinated enemy defences were the limiting factors.

TACTICAL MOBILITY

Our armoured and infantry divisions are expected to advance 100 Kms and 25 Kms, respectively, a day. This would be possible against light opposition or during the break-out period, but the nature of terrain, which includes extensive lay-out of artificial obstacles, and enemy defences along our Western borders, as existing today and likely to be made more formidable with the passage of time, have adversely affected our tactical mobility. Assuming that our formations could advance as required of them, it is a matter of conjecture if the present organisation adequately caters for their logistics in enemy territory with a population as fanatic and hostile as we are likely to encounter. The enemy, substantially assisted by civilians, is capable of disrupting our communications or alternatively of compelling us to deploy a sizable force to ensure their protection—thereby reducing our fighting potential.

In any case it will not be prudent to do the obvious—to meet the enemy head on in his well-coordinated defences, and as a consequence suffer heavy casualties. To unhinge and unnerve him there is a definite requirement to have a formation which can overcome the restraints imposed by the terrain and enemy. A formation which can develop operations anywhere deep in the enemy's rear and be in a position to sustain itself. Such a formation must possess tactical mobility far in excess of the what is available at present. In this context it is pertinent to study the concept of air mobility and the air mobile division.

MOBILITY

Firepower and mobility are basic to war; of the two, mobility probably is more important. Superior movement will invariably defeat a slower force, unless it has overwhelming firepower. Hannibal, Alexander and Genghis Khan amply proved the superiority of mobility over firepower. The invention of gunpowder forced the massed armies to quit their classical manoeuvring and take shelter behind castles and forts. Frederick the Great re-established the value of mobility, and Napoleon balanced it with firepower. The use of machine-gun in World War I, resulted in a stalemate on the Western Front. The Maginot Line, which was constructed by the French to defend their country proved impotent in the face of German tank formations, which once again proved the superiority of mobility. During World War II, tanks were the instrument of mobile warfare, and their use on a large scale paid handsome dividends.

The mobility of tanks may be threatened by the nuclear age in Europe. In our context, however, the tanks have lost a great deal of their mobility due to enemy defences, which have been sited to deny them the space for manoeuvre. Against well-coordinated defences they are ineffective due to anti-tank mines, which are difficult to locate and more so to break, and long-range anti-tank weapons like guided missiles. This situation is somewhat reminiscent of the Maginot Line. Therefore, a suitable instrument of mobility to overcome this situation must be found. An aircraft, the main vehicle of the battle of the future, is just the instrument. The Allies discovered the usefulness of tanks only when the Germans overran Europe. Let us plan to exploit the potential of air mobility to our advantage before our enemy does.

Mobile action forms an integral part of the following principles of war:—

(a) Offensive action.

(b) Co-operation.

(c) Flexibility.

(d) Concentration of force.

(e) Economy of effort.

(f) Surprise.

(g) Security.

Apart from the existing means, which are progressively being improved, the more advanced countries are considering improving the mobility of their armies on the following lines:—

(a) A jet engine powered flying belt is under development that

would permit the individual soldier to fly over various types of obstacles—natural or artificial. A rocket-powered belt has been in use in the US Army since 1961, but it has a limited range—only about 20 seconds.

(b) An 18-foot-high man-shaped walking machine is being developed in the US. Run by a man standing inside, the huge "pedipulator" will amplify his actions with its metal arms and legs making him able to step over trucks, pull up small trees by their roots and carry telephone roles with ease.

(c) Twelve-hundred-man battalions may one day be lifted anywhere on earth by man-carrying ballistic missiles.

(d) Rather than load a piece of artillery inside a cargo helicopter, the artilleryman of the future may fly his weapon by using a set of motor blades built right on it.

In the space age such innovations should not be considered beyond the realms of possibilities. The above items, in fact, have been designed by different companies in America and are in experimental stages.

To us in India it looks like a fantasy, and we should not be carried away by it. Our economic resources and technology do not permit us such luxury.

We should, however, endeavour, to improve the mobility of our Army. Towards this end we should consider exploitation of the potential of air mobility. During the next decade or so we should be in a position to produce helicopters and other aircraft to equip an air mobile division, which would by then be a necessity and, not a luxury.

NATIONAL POLICY

The Army's role is to defend India against external aggression and help in the maintenance of law and order. Our borders with the neighbouring countries cover over 4000 miles. The present threat to our country is along our western, northern and north-eastern borders. Our reserves to reinforce a theatre of operations are located fairly close to the borders as the means of communications—rail and road—do not permit a fast build-up, besides being vulnerable to hostile air action. There is also a possibility in certain parts of the country of subversion and sabotage, which can delay our build-up.

The reserve formations are held separately for each theatre of operations due to slow and time-consuming movement from one theatre to another. Their locations in certain areas are not suitable for training.

It is possible that the enemy may achieve a break through our defences and threaten our vital areas. When he is so intended there is a requirement of a force which can isolate him from his bases, and assist other formations in its destruction.

Air mobility as the basis of organisation will assist the execution of our national policy of war—its aims and objectives, as under:—

(a) The build-up will be quicker.

(b) Number of reserve formations may be reduced if they can be centrally located and moved more quickly.

(c) An air mobile formation can isolate enemy formation, which intrude into own territory, more effectively.

It is appreciated, though, that our ability to exploit the full tential of air mobility in the mountainous regions along our northern borders will be restricted.

TERRAIN

General Hawze, a leader in the air-mobility revolution, says "Most important is the ability of the new (air mobile) division to turn upside down the problem of terrain obstacle...".

An air mobile formation will be able to operate freely anywhere in the plains along our Western border.

The mountainous terrain may restrict the employment of air mobile formations due to weather conditions and absence of landing facilities. There would, however, be certain areas where such formations can be usefully employed.

LIKELY FUTURE WAR

Any future war, like the ones in 1965 and 1971, will be of a short duration. Victory will rest with the country which can strike at the other's vital areas. For this purpose an air mobile formation may prove decisive.

The pattern of war along our western border has already been discussed. Suffice it to repeat that air mobility offers a more effective means of applying the various principles of war.

Wherever possible the concept of air mobile operations is valid for the type of terrain on the northern and north-eastern borders. This concept offers us a better means of dealing with our likely enemy along these borders. Air mobile units will be able to locate, isolate and destroy the enemy in mountainous and jungle terrain. Such units would also be able to sustain themselves for a longer period. The enemy's line of communications will be extremely vulnerable to air mobile units, which may force

him to restrict his advance, as well as employ disproportionate troops to protect his communications.

The technical development must be subservient to our tactical requirements and not vice versa. Our country must provide the Army with the necessary wherewithal to effectively carry out its role.

The army is normally considered a drag on the economy and there is always an effort by certain elements in the country to decry its demands for additional resources to effect operational improvements.

Our country will not be rich enough, in the foreseeable future, to allow the acceptance of air mobility as the basis of organisation of all divisions. Nor is it desirable. There may be a requirement of one or two air mobile divisions, and an air cavalry troop for others.

To offset the extra expenditure on air mobile division and other air mobile units, the Army will have to effect reduction/reorganisation to reduce overheads.

INSTRUMENT OF AIR MOBILITY

The air mobile concept envisages the employment of helicopters, of various types and sizes, light observation planes and transport planes which can take off and land from very short runways. It is, however, the helicopter which has brought the speed of air travel down to ground level. Helicopters are being extensively used to move troops on the battlefield. They also serve as platforms for firing machine guns, 20 mm cannon, rockets, anti-tank missiles, grenades, mine and line laying, and even for bridging.

Helicopter can take off and land almost anywhere. It can fly almost at treetop level and often a foot from the ground. Its use by the Americans in Vietnam has created changes in tactics and organisation. An air mobile unit largely based on helicopters can ignore rivers, minefields, mud, barbed wire, swamps, deserts and any other obstacle by skimming over it.

The helicopters developed so far suffer from the following major limitations:—

(a) Uneconomic—difficult to maintain in the field and higher fuel consumption than conventional aircraft.

(b) Vulnerable to enemy ground and air attack.

(c) Restricted pay load.

They need more manhours of work on the ground for each hour of

flight than a fixed-wing plane but the difference is being gradually reduced. In 1959 a guide for staff officers of the US Army listed 16-17 manhours of maintenance per flying hour. While the relatively new helicopter, hoquois, needs only 7.5 hours. This is likely to be further reduced with new technological developments.

American losses due to enemy action in Vietnam work out to approximately one for every 10,000 to 10,500 missions. During World War II, the American Air Force sustained much higher losses. It may be argued that the US forces in Vietnam are fighting ill-equipped Viet Congs. Therefore, the losses against a better equipped enemy—having an effective air power and sophisticated missiles—may not permit employment of helicopters. The US Army in a computerised programme subjected a helicopter formation to an attack by anti-aircraft weapons, including missiles, and found a loss rate of 5 per cent, which is not substantial. The missiles are not effective below a certain height and distance. These losses could be further reduced by making the helicopter sturdier and faster. The US Army aviation enthusiasts maintain that a helicopter formation is no more vulnerable than a vehicle convoy during World War II or the Korean War. Unlike the vehicle column which is restricted to limited and known roads, the helicopter formation can fly anywhere. The loss can be further reduced by training pilots to fly low along roads or rivers or below the surrounding hills. Flying techniques can be mastered by pilots to take evasive steps against enemy air action.

HEAVY PAYLOAD

Helicopters capable of carrying 31 tons of payload have been developed in foreign countries, and with those 40 tons payload are under development. Similarly, a new helicopter designed to be an airborne gun platfrom is under development. Once a 40-ton helicopter has been developed, it would be able to transport a medium tank.

Light and transport planes required for an air mobile division should be STOL and VTOL types. It is important that an aircraft should be able to land and take off from anywhere. And when this happens even if the enemy has air superiority he will not be able to deter our aircraft from operating. SATS (Short Airfield for Tactical Support) may well provide an answer till we can have sufficient VTOL and STOL planes. Essentially SATS involves the employment of carrier technique ashore. The IAF has also lately, tried a new technique of reducing the length of the runway. Such a system should enable our aircraft to take off and land at a runway as small as on INS Vikrant.

The air mobile concept, therefore, rests largely on the employment of helicopters, light and transport planes which can take off and land at short runways. As a matter of interest Ist Cavalry Division (Air mobile), US Army, has 434 aircraft, out of which 428 are helicopters of various types. Transport support to the Division in the Combat Zone is provided by the air transport brigade which has eighty STOL (480 feet to land and 725 feet to take off) CV 2 Caribous and 41 helicopters. The brigade can maintain the Division from as far as 175 miles.

If the requirement of an air mobile division is accepted, its logical consequence would be the introduction of army aviation units as an integral part of the Army. The IAF should not have any serious objections to the birth of army aviation, if it does not involve any reduction within its ranks. It will continue to be responsible for the transportation of the army units to the battlefield and air support over it.

The Division has 1600 vehicles—trucks and jeeps—which can be carried in its own 434 aircraft.

AIR MOBILE DIVISION

The organisation of an air mobile division of the US Army is given in Appendix 'A'. This organisation can provide the basis for one more suitable condition pertaining to our country. Based on the current organisation of an air mobile division in the US Army, it is appropriate to study its capabilities and limitations.

CAPABILITIES

The division is capable of air assault operations as a part of a joint force.

It can carry out ground operations in all types of terrain like any other division.

The division is capable of immediate response and rapid manoeuvre over a large area.

Its elements can carry out reconnaissance and screening actions over wide fronts.

It can carry out raid in the enemy's rear on a selective basis and counter hostile air mobile airborne and irregular forces.

Recycling of combat forces for immediate use in other areas by vertical entry and recovery of uits into and from the battlefield.

Changing the tempo of a single engagement and the frequency with

which combat actions can be initiated by promptly applying the mass and intensity of the division attack against the enemy.

Locate and maintain contact with the enemy or between other friendly forces.

LIMITATIONS

Limited ground vehicular movement. Lacks armour, medium and heavy artillery.

Vulnerable to a sophisticated air defence environment.

It cannot sustain itself as well as a normal division during prolonged combat.

These limitations are no different or more serious than those inherent in an armoured or airborne division. Armed helicopters to a large extent make up for the loss of medium and heavy artillery. Similarly loss of armour can to a large extent be offset by the offensive capabilities of helicopters firing missiles and rockets.

Another argument against the air mobile division is that it is most effective against guerrillas, and not well suited for sustained combat. Suffice it to say that so far it has been employed only in Vietnam. It may be premature to comment on its effectiveness in other types of warfare. In any case our infantry division has much less firepower than an American division, with which the air mobile division is being compared.

EFFECT ON OPERATIONS ARMS AND SERVICES

In planning an operation preliminary reconnaissance is done from a specially-equipped observation plane. They survey the territory with radars and aerial photographs. During this reconnaissance a base of operations is selected. Aerial reconnaissance assists in maintaining surprise about the actual area of operations as it covers a wide front.

Detailed information can be gathered by light observation helicopters. They can carry out this task on the same lines as our present-day patrols. When necessary, they can deliberately draw fire. In the Ist Cavalry Division (Air mobile), they move in pairs. They go up and down from behind cover and fire a short machine gun burst until they provoke the enemy to return fire. If they discover anything substantial that might interfere with the projected operations—such as tanks or fortifications—they call for missile-carrying helicopters, to engage and destroy them. Aerial reconnaissance can also give a fairly good idea about the enemy's obstacle lay-out, which our patrols fail to do. Aerial reconnaissance will considerably reduce the time required for acquisition of information. If aerial reconnaissance does not

succeed, the helicopters can land at an interim point from where ground reconnaissance can be carried out.

DEFENCE

An air mobile division is capable of holding much wider frontages because of its ability to move troops quickly—at a speed of 80-100 miles an hour. According to US Army doctrine the division can cover a frontage of 53 miles in a delaying position, which is 3½ times the frontage that a Road division can defend. Our infantry division covers a considerably lesser frontage.

The division is in a position to fix the enemy's axis of attack well in advance, as well as interfere with his preparations for attack and the actual assault with armed helicopters.

Airlift capability and consequent quicker movement within a defended sector offers a greater chance of success for the counter-attack force, which can be launched against the enemy from an unexpected direction.

In our context, when it is not possible to defend the entire length of the border, the air mobile division can be effectively employed to prevent an enemy breakthrough.

Laying of mines will be much quicker; so can be the build-up.

The division will not be road-bound, and can be maintained even if the enemy succeeds in isolating it from the administrative areas.

Administrative areas can be sited farther away from the defended sector, where they will not be vulnerable to enemy ground action.

ATTACK

After detailed information about the enemy has been obtained by the light observation helicopters, and a firm base has been selected the artillery can be moved to gun areas from where it can start engaging various targets.

The assaulting troops need not go through the present assembly areas or forming up places but instead should be carried by helicopters protected by armed helicopters. As they near the landing zone, the armed helicopters will saturate the objectives with rocket fire. As the troops carrying helicopters come in to land they start engaging the objectives with machine-gun fire. Helicopters fly in and land the troops almost in the same formation as they are to assault. Helicopters take off as soon as the assaulting troops are landed to avoid getting shot up. In Vietnam the pilots land the troops and are off within 10 seconds.

During World War II and the Korean War almost 50 per cent of the casualties occurred before the troops reached the front because the assembly areas, railheads or other targets were under artillery and air fire. The air mobile unit avoids this exposure by flying directly from a safe rear area to combat.

For night operations or in an area where there are few land marks "path finder" units may have to be dropped earlier to set up electronic navigation devices.

Location and neutralisation of enemy guns and other vulnerable targets will be easier.

The employment of reserves from a different direction will be easier.

Assault can be carried out from a direction which does not have minefields and other obstacles. Similarly reorganisation will become much quicker as it will not be contingent upon the opening up of lanes and gaps through the minefields.

River and canal crossing may become obsolete as operations of war—an air mobile unit could cross anywhere.

It will be easier to determine the enemy's direction of counter-attack and effectively disorganise it in its preparatory stages.

Advance

The whole concept of advance will be revolutionised. The air mobile division could be moved over a distance of about 100 miles without the enemy being aware of even the preparations for it. In fact this operation of war may become redundant in its present form.

Withdrawal

An air mobile formation will be able to move out of a defended sector, and into a new main position without much interference from the enemy. Armed helicopters could impose considerable delay upon enemy's advance.

Raids and Infiltation

Air mobile units are ideal for such tasks whether in the plains or in the mountainous terrain.

Air

It may be argued that the enemy's air superiority may restrict the employment of an air mobile division. The situation would be similar for

the armoured and infantry divisions if the enemy has such an overwhelming superiority. Helicopters should be able to operate as well by night as any other vehicle, if not better. Whenever large helicopter formations are airborne they will need air CAP.

ARMOUR

An infantry division has got one armoured regiment for offensive tasks. This role could be taken over by armed helicopters. Besides approximately one squadron could be heli-lifted once 40-ton helicopters are available. There is a school of thought which maintains that an air mobile division can adequately replace an armoured division.

ARTILLERY

Medium guns will have to be deleted from the WE of an air mobile division. The armed helicopters could to a large extent make up for the loss of these guns—as they could engage targets beyond the range of field guns, as also supplement their firepower.

ENGINEERS' ROLE

In an air mobile division the engineer regiment may have to be drastically reorganised. A large number of engineer tasks will become unnecessary (as they could be done by the Corps Engineer Regiment). Tasks like road construction and its maintenance may not be required on the present scale. Bridging, and laying and breaching of mines may not be of such an aiding importance. (Helicopters could be employed for both!). Talking of the role of Corps of Engineers, in an air mobile army, Lt Gen Dwight E Beach, head of Combat Development Command, US Army, had this "cold list of comfort" to offer to the Engineer Officers. "In providing this increased air mobility, the role of the engineers is obvious. Even the UH-IB and LOH (Helicopters) need a small cleared area to land".

SIGNALS

The range of radio sets will have to be considerably increased. Helicopters could be used for line laying.

INFANTRY

The size of infantry battalion could be reduced.

Airborne troops will become redundant, as instead of dropping paratroops all over the place the helicopters will enable them to land in an organised manner. It may possibly be the reason for the US Army to reorganise its 101 Airborne Division into 101 Air Cavalry Division (Airmobile).

ASC

Supplies could be brought directly from the base depots and delivered to the forward troops by transport planes. The number of vehicles and the heavy tonnage of POL involved to sustain them could be reduced. Ammunition supply could also be organised from depots.

AMC

Casualty evacuation and treatment will become more effective. The strength of the medical battalion and field hospital could be considerably reduced as the casualties would be evacuated directly from the RAPs to General or Base Hospitals. The Vietnam experience shows that of the wounded less than 1 per cent died compared to 8 per cent in World War I, 4.5 per cent in World War II, and 2.5 per cent during the Korean War. Of course, evacuation is one aspect; one should not ignore the vast advance that has taken place in life-saving surgery and medicine. In Vietnam there are airmobile teams—consisting of a surgeon, a medical specialist and other staff—with life-saving surgery and medicine requirements—which can fly and render immediate medical assistance.

AOC

It should be possible to reduce the huge stocks held in the OFPs and supply an air mobile division directly from the depots.

According to the US Army experience an air mobile division carries 1/3 of the tonnage of an infantry division, whose men, weapons and equipment work out to approximately 40,800 tons.

THE ECONOMICS

If an air mobile division enhances the fighting Potential of our Army, the economics should not really matter. Were cost the only criterion we would not have had an armoured division. Nor would we opt for mechanisation. US Defence Department studies show that air mobile units are economical when their capabilities are weighed. The equipment of an air mobile division will cost 2½ times as much as that of an infantry division, but operating costs, on a 5-year basis, are only 20 per cent higher. No official information is available on the savings that might be made in reducing the engineers, transportation units, quartermaster troops and other service units, which could make the air mobile division a fairly cheap military organisation.

An air mobile division can effectively replace an armoured division. The replacement of the armoured division by an air mobile division should therefore, be comparatively cheaper.

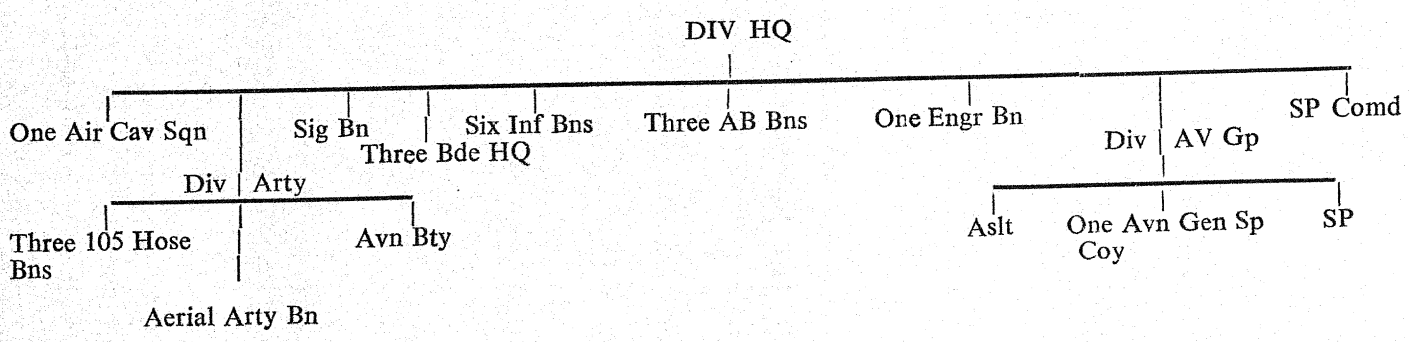
Our economy and the indigenous production of helicopters will not permit us to have an air mobile division till the late eighties. Till then every effort should be made to study and fully exploit the advantages accruing from the air mobile concept. With that end in view it is desirable to have an infantry battalion group entirely based on helicopters for each of the Corps operating along our Western borders. This battalion must have a complement of observation, troop carrying and armed helicopters.

CONCLUSION

An air mobile division is a vital requirement for our Army. The division will free us from the restraints imposed upon us by the terrain and the enemy, and provide us with a great degree of tactical mobility which is essential to unhinge the enemy holding elaborate defences, in any future war, or to isolate him in case he breaks through our defences. The planning for such a division must begin now. Till we are in a position to have an air mobile division, we should have an air mobile infantry battalion group for each Corps, along our Western border, to study and exploit the potential of the air mobile concept.

APPENDIX 'A'

OUTLINE ORGANISATION AIRMOBILE DIVISION UNITED STATES ARMY



Details

1.	Offrs & men	— 15,787
2.	AC	— 434
3.	Vehs	— 1,600
4.	One bde HQ and three inf bns will have AB capabilities.	
5.	Manoeuvre bns will be assigned to bdes as required.	

Types of helicopters

1.	Obsn (OHGA)	— 93
2.	Tpt (med)	— 48
3.	Utility (UHIB)	— 111
4.	Utility (UHID)	— 176
	TOTAL:	428

Details of armament

1.	Armament sub system heptr GM launcher (SS11)	— 12
2.	Armament sub system helptr 7.62 mm MG door mtd	212
3.	Armament sub system heptr 7.62 mm MGxM7	— 93
4.	Armament sub system heptr 2.75 in RL M 3	— 36
5.	TOTAL	353

MILITARY POTENTIALS OF HOVERCRAFT

LIEUT COLONEL VB SAIGAL

IN any operation of war, tactical mobility is paramount. Any army which can attain mobility can achieve decisive military achievements. It can thus strike the enemy at will at the place and time of its own choosing. Our army, like other armies of the world, depends on tracked and wheeled vehicles to provide it with the necessary mobility. But their drawbacks viz relatively high ground pressure and poor traction restricts ability to cross mud floats, swamps, deserts, snow, ice and water obstacles such as rivers and canals.

The tactical mobility of ground forces in difficult terrain has increased manifold by helicopters but still movement in riverine or delta areas, which are perennially marshy, depends by and large, on waterborne craft. The waterborne craft is not capable of negotiating shallows, sandbars and swampy areas and thus their employment in such terrain is restricted to a few deep-water channels, detracting from tactical mobility and flexibility in operations.

The Hovercraft can overcome this problem of tactical mobility in such terrain. It produces a low-surface pressure of the order of 40 lb per square inch which enables it to cross such areas at relatively high speeds, passing from one type of surface to another without pausing. Other factors which make it attractive for military use are its ability to accept considerable degree of overloading without significant loss of performance, comparative invulnerability and smallness of crew coupled with relatively short training period.

The Americans call it the Air Cushion Vehicle (ACV) or "Hydro-Skimmer", the Viet Cong have nicknamed it "quai-Vot" (monster), the GIs affectionately call it Charlie Victor (CV stands for Cushioned Vehicles), the French an Air Glider, the British a Hovercraft and the US Navy a "Surface Effects Ship". By any name, it is a revolution, a revolution in ground mobility and in mounted combat.

The aim of this paper is to study the evolution, principles of functioning, characteristics, limitations and military potentials of hovercraft, especially pertaining to our border areas.

Although the concept of ACV is not new, practical and dependable vehicles have become available only in the past few years. Christopher Cockerell, a British chemical engineer, first conceived the idea of using an air cushion between the hull of a boat and the water surface to make the boats move faster by reducing friction between them. This was in early 1950. His experiments resulted in the construction of the first Hovercraft in the World (SR. N1) which crossed the English Channel on a one-foot-thick air cushion at 25 knots in July 59. It had an all-up weight of 8,500 lb. Much of the pioneering work for the current ACVs was accomplished by British Hovercraft Corporation. Since then, a variety of ACVs have been produced in Britain, USA, Japan, France, Canada, West Germany and USSR. The latest British hovercraft is a 40-metre-long craft which loads 30 cars, 254 passengers and weighs 178 tons. It cruises at a speed of 130 kilometres an hour on a 3-metre air cushion.

The British tested various models of hovercraft for military use from 1961 to 1966 in various types of terrain viz jungle, deserts, marshes, snow, ice and water. As a result of these trials which were very successful, a squadron of Royal Transport Corps was equipped with hovercraft, at present in service in Singapore with the British Army and Naval units located there. The British Army has used hovercraft in Malaya and Borneo for several years to patrol rivers and interior areas inaccessible to other vehicles.

OPERATIONALLY TESTED

Hovercraft has also been operationally tested. Three hovercraft are at present in service with the US Forces in Vietnam. The Americans have mounted heavy machine-guns on the ACV and are using it as a patrol boat-cum-"anti-ambush" craft, over marshes and paddy fields. Its most effective use in Vietnam has been made by combining the ACV with the helicopter, for speedy movement of ground forces in the swamps of the Mekong delta in conjunction with elevated observation posts provided by helicopters. Hovercraft-helicopter teams employed in this manner have been able to clear difficult and inaccessible areas held by the Viet Cong, in a matter of days compared with months spent on such tasks in the past.

The principle on which the hovercraft works is that the vehicle rests on a self-generated "air cushion", the air being imprisoned between the bottom of the vehicle and a firm surface that can either be the ground or water, and kept in at the sides by an "air cushion" system. The ACV floats on a cushion of air created by a large horizontally mounted intake fan. Its hull, usually floatable, is shaped around a central chamber where

the air cushion forms. Effective hovering height is added in several models by the attachment of a flexible rubber "skirt".

The basic requirements are simple; a simple sturdy vehicle with a flat bottom, engines, a power fan, air intakes and jet nozzles to force the air into the "cushion". To go forward, the jet nozzles are pointed slightly backwards and to go backwards they are tilted slightly forward. It can move sideways or in any direction. Owing to the angles of the various jet nozzles, the air only "leaks" out from the "cushion" very slowly the self-generating pressure more than making up for any such wastage.

Forward propulsion is provided by a rotor which is similar to the rotor of an aircraft. More than one rotor may be fitted to provide additional speed. To reduce the air resistance the shape is streamlined from circular to oval, or rectangular although for between stability, a circular structure is more suitable. The hover height depends on the power and blade characteristics of the lift fan, and the weight and shape of the chamber. If the flow of the fan's exhaust is shaped by a central addition to the chamber, thus narrowing the escaping air flow, the hover height is increased.

The propulsion is usually through aviation propellers. However, marine screw propellers: sheels with drive shafts or chains, jet propulsion and deflection of the lift flow itself are also alternatives.

CHARACTERISTICS

(a) ACV is capable of cross-country and amphibious movement at high speeds. Present maximum speed is 130 kilometres per hour.

(b) It can also make faster speed across a great variety of terrain than any other surface vehicle.

(c) It exerts a very low ground pressure enabling it to pass over conventional anti-tank minefields without detonating the mines and move from water to sand, across mudflats, sandbanks, swamp, log and debris infested rivers, minor rapids, ice and snow without much reduction in speed, thereby fully exploiting its amphibiousness.

(d) It does not require any special highway to operate upon. In open country it can move nearly anywhere but in close country and on roads, it requires the "right of way" because it is not manoeuvrable as the wheeled vehicles.

(e) In open seas its operation is limited by wave height and strong winds.

(f) Inland, it can operate under almost all weather conditions, whether in mist or fog, by day or night, using radar. It is not affected by adverse weather. When all forms of air, land and water transport are paralysed, it can still continue to function effectively, though with slightly reduced efficiency.

(g) It can be armed with a variety of weaponry, including machine-guns and guided missiles to give support to the infantry they carry.

(h) If necessary, armour can also be provided to protect its vitals, the crew and troops from enemy small arms fire, though this would be at the cost of payload.

The hovercraft is not particularly vulnerable and will continue to operate effectively, even after considerable damage to the structure and skirts, whether due to enemy action or accidents. In fact, it is claimed that as long as the engine remains serviceable, it will be able to return to base without assistance. If shot down, it has little height to fall, thus giving marked advantage over helicopter.

(a) It can cross solid vertical obstacles up to 90 per cent in height to the depth of the flexible skirt, the exact height depending on the profile of the obstacle. Also it can traverse ditches which are about half its length.

(b) Thus a craft with a 4-foot skirt can cross a 4-foot step and a 5-foot obstacle with a rounded top. The same aircraft can deal with a 6-foot scrub and elephant grass 9 feet high.

(c) It can tackle slopes of 1 in 8 gradient comfortably and with sufficient initial speed it may be possible to negotiate slopes with a gradient of 1 in 3.

It is simple to operate and requires no elaborate bases or support installations. At present it requires about three hours of maintenance for every hour of operation compared with eight hours required for a helicopter. These timings too should reduce with experience.

Repairs to the hull and skirts can be carried out by semi-skilled men with a minimum of training. The engine and electronics, however, would require skilled technicians.

TRAINING OF PILOTS

Previous flying experience, though an advantage, is not an essential qualification for a potential pilot. An aptitude test would, however, be

necessary. Thereafter, most selected pilots should be able to do their solo after 11 hours and fully qualify as pilots in 23 hours. Specialist training would be required, in addition to this, to cater for a particular assigned task.

Operating and maintenance costs of a hovercraft are much cheaper than those of a helicopter. Design calculations indicate that eventually operating costs of bigger models of ACV will be comparable with the tracked and wheeled vehicles.

Large hovercraft can lift loads which are far beyond the capacity of helicopters. They can carry heavy loads at high speeds. The US make SK 5 model has an average cruising speed of 50 miles per hour, maximum speed in still air 70 miles per hour wtih a payload of 3 tons, but can take overload up to 4 tons with small reduction of speed and hover height.

LIMITATIONS

(a) **Manoeuvrability**

(i) It lacks manoeuvrability. Due to lack of contact with the ground, it cannot take sharp turns and liable to move sideways in the direction of strong winds causing serious drift or drag. This shortcoming is being overcome by providing wheeled or tracked chassis.

(ii) It is slow to turn and hard to stop. A US made SK 5 model has 250 yards turning radius when at a constant speed of 40 miles per hour. At the same speed it decelerates to a standstill in 100 yards, using normal braking procedure.

(b) **Mobility**

It is wide in relation to payload and too wide for use on jungle tracks or escarpment paths. For cross country moves at top seeds, ACVs will require "hoverways". By "hoverways" is meant pre-planned routes which by-pass major obstacles and along which the smaller ones have been cleared or reduced to an acceptable height. The present designed largest craft requires a "hoverway" 30 metres wide and an overhead clearance of 13 metres. There are plans for retractable sides which, when retracted, reduce the overall vehicle width to under 9 feet with a wheeled chassis. The width reduced by means of retractable sides, a hovercraft designed for reconnaissance role with a crew of 2 or 3, should then be able to negotiate any defile which it cannot circumvent in the hover model.

(c) **Vulnerability**

(i) It is too noisy compared to any current army vehicle of equivalent size and payload due to aircraft propeller used. This coupled with its bulky size is likely to give an early warning of its approach when operating in featureless terrain. Developments are under way to replace the aircraft propeller used for thrust.

(ii) On dry sandy soil, it raises a dust cloud which, though controllable by operating techniques, is visible from a long distance. The trail left on the ground would instantly give away its position from the air. On water or wet ground, however, it will not leave any trail.

(iii) The relatively large size, lack of manoeuvrability and conspicuous trail left behind in its wake make hovercraft easy targets for aircraft or armed helicopters. Its amphibious capability, however, enables the hovercraft to be camouflaged under suitable cover.

(d) **Obstacles**

(i) With the present design, it cannot climb over a vertical step of more than 4 feet.

(ii) It cannot negotiate slopes steeper than 1 in 8. The US have, however, produced a model which can climb short stretches of 50 metres of a 40 degrees slope at 48 kilometres per hour.

(e) **Limited Endurance**

Endurance is limited to 3½ to 4 hours of operation at 40 miles per hour. But later models like SR N4 have 8 hours endurance.

(f) **Corrosion**

At present it suffers from corrosion and a reduction in engine power and lift because of spray ingestion over water (sea) and dust ingestion over land (desert). This problem of corrosion and spray ingestion has been reduced considerably by using advanced techniques in later models.

(g) **Mountainous Terrain**

Operation of hovercraft in mountainous terrain with the exception of river valleys, is as yet out of question.

MILITARY POTENTIALS

Logistic Support. As long as its "air cushion" is under 6 feet, the main military value of hovercraft would be its carrying capacity. In battle,

supply routes are very often denied by blown-up bridges, obstacles, demolitions, minefields, and rubble created by bombardment of areas. In such conditions, a soft vehicle or even a tracked one cannot operate efficiently. The ACV could here be used to move troops, key personnel, ammunition and supplies over fairly long distances over obstacles, which would mean that reinforcements and supplies could be quickly sent forward; while formations could be speedily moved from one place to another and the supply pipeline could be streamlined and simplified. Over swamps, salt flats, marshes, desert and snow bound areas, ACVs would be an ideal mode of military transport. Areas which would normally be accessible only on foot would now become important avenues of approach to aid mobility and concentration of forces.

Cross-Country Movement. If the ACV could be fitted with tracks, like a tank, this would add a tank's cross-country capability to its others, and turn it into a fighting vehicle, which could be armoured. Tracks could be brought into use to surmount obstacles as they were encountered, but otherwise the vehicle would move on its "air cushion".

Tank-Carrier. The present-day tank-transporters are wheeled, heavy and can be used only over first class roads and bridges. During battle, these roads may not be usable due to demolitions or blasted bridges, thus compelling the use of long detours before the tanks can take up battle positions. ACVs would come to the rescue here and deliver the goods. The tanks could be moved and positioned in the battlefield over completely untenable terrain.

Multi-Purpose Battle Vehicle. Now that the hovercraft "air cushion" depth has been increased to 3 metres (approximately 10 feet), it can probably be turned into an effective multi-purpose battle vehicle, for use practically anywhere on land and for offshore work. Tracks or wheels would be an added luxury. For land vehicles can cross 8-10 feet obstacles easily, if at all, and so the hovercraft could do more, by crossing terrain such as marshes, that would be impossible to tanks, even amphibious ones, which would sink in the soft matter.

Raids. ACV affords an excellent potential for raids. Moving inland on river routes or across level ground at near helicopter speeds, below the effective height of radar surveillance, ACVs can move at an inland assembly area or target without offering a lucrative target. ACVs can exploit breakthroughs by ranging fast and far, disrupting enemy communications and breaching minefields.

Casualty Evacuation. ACV ambulances can be used where enemy air, air defence or weather denies helicopter evacuation of casualties.

Reconnaissance. In this role, ACVs must work in close co-operation with helicopters. A helicopter-hovercraft squadron could make a well-balanced reconnaissance force. Hovercraft for this role will have to be small with a wheeled/tracked chassis and have an endurance of at least one battlefield day. It should carry a crew of 2 or 3, be armoured and equipped with a quick-firing cannon and machine-guns, passive night-vision device and radio.

Obstacle Crossing.

(a) **As a Ferry Vehicle over Rivers and Canals.** As a ferry vehicle, ACVs could load well back from the obstacle, cross at high speed and unload well beyond it. Thus they can achieve surprise by speed and because no preparation of site is necessary prior to crossing. They can carry assault infantry across the obstacles to cover crossings of their own APCs.

(b) **Crossing of Mine Fields.** ACVs can achieve surprise by crossing assaulting infantry across minefields.

Types of Hovercraft and Roles. Assuming that ACVs have a minimum 2 feet and maximum 8-10 feet of "air cushion" and are fitted with tracks, thus being able to overcome moderately-sized obstacles, one might visualise that three sizes might be used by an army, each of which would provide a basic platform or chassis on which variations could be built to meet particular needs and tasks. Briefly, they would have to be small, medium and large.

(a) **Small**

The small hovercraft would be in the "jeep" class, the type that could carry up to 4 men, their equipment, rations and a certain amount of fuel. This type could be used for reconnaissance, liaison and perhaps for small support weapons, such as the recoilless anti-tank gun or a mortar.

(b) **Medium**

(i) The medium-sized hovercraft would be the standard battle vehicle, large and powerful enough to be armoured so that a degree of protection would be afforded to enable it to operate in the forward areas. It would have to be big enough to be able to take a small platoon (20-25 men) fully equipped, with arms and rations and have a radius of action, exceeding the present tank, in the region of 500 miles or more. Used as an Armoured Personnel Carrier (APC), the infantry would possibly dismount to go into action, and to

fight in jungle or mountainous terrain, much as they do at the moment.

(ii) The medium-armoured hovercraft could replace all the existing armoured fighting vehicles in armies, including the battle tank. It could mount one, or even two, heavy guns, but unless it was actually moving on its tracks at the time, it would otherwise have to stop to fire them. Its speed on its "air cushion" would more than compensate for that. It could also be used to carry support company detachments with mortars, anti-tank guns, air defence guns or a short range missile, be a Command or a Communication Vehicle or Ambulance, a ration truck or used for raids. In short, in the "teeth" arms, it could replace the whole range of vehicles now in use.

(iii) One might visualise an all arms, battalion sized battle group of guns and infantry, requiring some 20-24 such hovercraft, with perhaps another half a dozen or so of the smaller "jeep" class ones.

(c) **Large**

(i) The larger hovercraft would be the heaviest transport vehicle designed to carry large numbers of men and a greater weight of material over long distances.

(ii) The requirement might be to take 120-130 fully-equipped men, tanks or some 50-60 tons of material, and in view of the performance of the present models, this does not seem to be too far in the distant future. The distances involved would be single hops of 500 miles or more. Experts are inclined to feel that fuel, design, maintenance and other technical factors might mitigate against a higher performance, that probably being the optimum.

Deserts. A combat formation comprising a reconnaissance unit, infantry, artillery and engineers equipped with hovercraft, helicopters and combat vehicles should be able to operate successfully in desert areas against an enemy unequipped with armour or even against one equipped with only little or light armour. Anti-tank protection could be achieved by equipping the force with a simple guided weapon system.

Flat Jungle or Delta Country.

(a) In flat jungle or delta country, hovercraft can move freely over water an all surfaces unable to support any form of tracked or wheeled vehicles.

(b) Again, working as a team with helicopters, they afford to a force of all arms, other than heavy armour, a mobility never achieved even by the lightest of light cavalry.

(c) In these conditions, the hovercraft, although confined in the jungle to waterways, has the advantage over the helicopter of greater endurance and more efficient patrolling in places where the undergrowth obscures the view from a helicopter. It can also more easily dismount a patrol, where necessary, and having dismounted it, cover it from a stable, mobile fire platform and act as a base from which it can operate for several days.

USE IN INDIA

Hovercraft would be of great use as a means for mobility for troops, weapons, stores and equipment in the riverine of West Bengal, Assam and the marshy salt flats of the Runn of Kutch where movement by normal water or land transport is difficult and at times possible.

Since ACVs can be armed with a variety of weapons to support the infantry, they would offer considerable flexibility in hovercraft-infantry operations in such terrain.

The vulnerability of ACVs over conventional amphibious craft when crossing water obstacles is considerably reduced due to reduction in time of exposure by speed in movement. Since shallows, marshes, sand banks and fast currents do not impede their performance, their employment permits a much wider choice of crossing places. They also afford scope for employment in the subsequent build-up in assault river operations when they could be used to rapidly move reserves and supporting weapons right upto the forward troops beyond the river line, thereby avoiding transhipments.

ACVs would be indispensable to the Engineers in rapidly transporting bridging, rafting and ferrying stores to the waters' edge across extensive sand banks.

The main engineer effort in a river-canal crossing in Punjab consists of laying extensive track expedients on sandy approach/exit banks which do not permit sustained use by wheeled vehicles. In such cases, hovercraft could be used to advantage to dump track expedients at regular intervals, thereby enabling Engineers to open the route quickly.

Any large-scale cross-country movement on the Rajasthan border would be confined to the scanty roads and tracks, many of which cannot take

sustained traffic. Since the employment of ACVs in open country need not be restricted to roads and tracks, it could be used for cross country move of troops, rapid movement of Artillery to achieve surprise and avoid counter-bombardment, raids, aggressive patrolling and logistic support.

However, its large size, lack of manoeuvrability, comparatively large trail left behind and the dust cloud raised due to its operation would make it very vulnerable from the air. Besides, the large quantities of sand likely to be sucked into its engines would create technical problems.

Ladakh is partially a cold desert with sharp gradients beyond the capabilities of the ACV but it would certainly be able to move over the constructed routes with ease. This would be of great assistance in winter when the high passes are blocked with snow and ice. ACVs would prove more economical than helicopters and would operate independent of inclement weather conditions.

In the interior of Ladakh, there are no routes except for meandering river beds. During summer, the snow melts and causes the rivers to become a torrent. The flow is so fast that they almost become rapids and roll along huge boulders with them. ACVs with 6-8 feet of "air cushion" could easily operate on these rivers and keep vital links open.

During winters, the river beds become ice and the routes are negotiable by foot only. Some of the border outposts take as much as two weeks to reach on foot and are only turned over once in a year during winters. ACVs would make such trips less torturous as the same distance could be covered over the ice in a day.

Hovercraft would be indispensable during floods for carrying out relief/rescue operations in riverine terrain, when all land and water communications are breaked and villages are completely isolated by flood waters. They could thus augment the fleet resources of the army when called out for rescue/relief operations during floods.

CONCLUSION

The cross-country and amphibious capability and the ability of hovercraft to negotiate soft terrain makes hovercraft the only vehicle capable of carrying out military operations in riverine terrain. Its lack of manoeuvrability and vulnerability to air attack, however, would preclude its extensive use in favour of the present conventional forms of transport.

Hovercraft has endless possibilities as a military vehicle and deserves to be carefully examined and evalued. They most probably will be seen coming into experimental service in several armies during the next decade

to replace the existing logistic fleets and also be used widely in tactical roles. Israel is replacing its naval patrol boats by ACVs and Libya is contemplating their use in the desert.

ACVs would be of great value for military operations in the riverine terrain of West Bengal, Assam and the marshy salt flats of the Rann of Kutch. They may also be useful in crossing of water obstacles in Punjab. We in India must watch with greater interest the development of this new concept of mobility which has almost unlimited possibilities. We have the necessary industrial potential, the required skills and brains for the production of Hovercraft and should look forward to its manufacture within the country in the near future.

It is ironical that tanks were not taken seriously by the country of its inception in World War I and as a result the UK did not form mechanised forces till it was almost too late. We should learn from the costly blunders which are in abundance in history; for the ACVs may be in an identical stage of development as the tank was during World War I.

ZULFIQAR ALI BHUTTO

A REVIEW ARTICLE

PRAMOD KUMAR MISHRA

ZULFIQAR ALI BHUTTO, the President of Pakistan, will go down in history, as a controversial personality. At home, especially in Punjab and Sind he enjoys tremendous popularity. Many in India rate him as a prisoner of indecision. The World Press tries to look at his difficulties at home quite sympathetically. But nevertheless the fact remains that Bhutto continues to remain a major force in the political undercurrent of Pakistan. He has also succeeded to a considerable degree to reintroduce parliamentary democracy and a viable constitution after two decades of military rule. He is the sheet anchor of new Pakistan's foreign policy. His dealings with the opposition at home indicates certain amount of maturity.

In order to study Bhutto's personality and his role in Pakistani and World politics, one needs to go into the details of Bhutto's parentage, childhood acquaintance and the environment in which he grew. Dilip Mukherjee, an economist turned journalist, who has visited Pakistan several times presents in his book a fairly accurate summary of events which brought Bhutto to power. Piloo Mody, with the insight of a childhood friend, recalls the formative year of Bhutto's life and traces a link with the present. Let us try to compare and contrast the views of the two authors issue-wise.

About Bhutto's childhood and adolescent days, Mody quite naturally pays maximum attention. His (Bhutto's) family, belonged to one of the prominent clans of Sind, where according to the author (Modi), "a rigid Feudalistic society continues to exist even to-day" (p. 14.) He traces his friendship with the Pakistani President through innumerable quarrels on issues concerning the Partition of India. Bhutto from the very beginning, as the author recalls shared his feelings with Jinnah in the movement for Pakistan. Mushtaq Ahmad, a cricketeer in the pre-partition India remembers the teenager Bhutto as "extremely sensitive, very touchy and

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ZULFI MY FRIEND by Piloo Mody (Thomson Press, Delhi, 1973 pp. 183, Price Rs. 24.00) ZULFIQAR ALI BHUTTO by Dilip Mukherjee (Vikas Publishing House, Delhi, 1972, pp. 240, Price Rs. 20/-)

easily offended" (Mody, p. 28). But however, Mody feels that "his personality, his capacity to absorb abuse and anger from his friends, and his refusal to allow such incidents to diminish his respect for them was quite remarkable". (p. 35) Mukherjee's account of his (Bhutto's) formative phase is extremely sketchy. The author points out that young Bhutto also used to admire Hans Kelson, his Berkeley Professor and Krishna Menon. The readers can also be amused to know that he used to take special interest in Nargis, the popular Indian star.

About Bhutto's dramatic rise to power the two authors give different explanations. To express Mody's point of view in his own words, Bhutto possessed the natural background academically and professionally to achieve high position. Mody writes, "Reading and researching his life since 1953, I did not find a single instance where Bhutto demanded something he had not earned, or fell a victim to accepting easy office by compromising his stand on any issue of fundamental importance to Pakistan. (p. 57) On the other hand although Mukherjee admits Bhutto's privileged family connections he subscribes that the reason why Iskander Mirza picked up Bhutto for a cabinet position was that the latter as a member of the minority sect of Shias, had an added reason for preferring a Fellow Shia. Moreover he (Mirza) happened to be a personal friend of Bhutto's father, Shah-Nawaz Khan. Again Mukherjee feels that because of Ayub Khan's patronage, Bhutto, "from a young lawyer unknown outside Karachi drawing rooms, became a seasoned politician commanding wide popular support in West Pakistan." (p. 35).

The origin of Bhutto's foreign policy can be traced from the time he was included in Ayub Khan's cabinet. Although at the outset he acted more or less as a protegie of Ayub, gradually he drifted away. Mody in a separate chapter on his foreign policy admires Bhutto as the pioneer of Pakistan's policy of triangular balance. To him Bhutto is decisive and consistent in his foreign policy planning in short contrast to India's policy of excessive reliance on a series of happenings. Bhutto in Mody's anology builds his entire policy on the geopolitical realities of Pakistan and combines it with a shrewd assessment of the self-interests of the three global powers. He is however, critical of Bhutto sharing a common feeling among the ruling elites in Pakistan that India accepted partition under pressure of events and would seek to undo it (p. 77). Reading Bhutto's mind on Kashmir, Mody feels that he may not give up his claims, but the emphasis on them will vary (p. 79). Now Mukherjee while analysing Bhutto's foreign policy is of the view that the latter was not instrumental in shaping Pakistan's China policy. The author writes that Pakistan's first overtures to China were made in 1959 long before Bhutto became Foreign

Minister. According to him the relationship with China flowed directly from the Sino-Indian conflict and indirectly from Pakistan's disenchantment with U.S.A. (p. 44). He however, admits that Bhutto as Minister of Fuel and Natural Resources was responsible for the acceptance of a Soviet offer to help exploring mineral resources, particularly oil (p. 39). Also to some extent he was successful in persuading Ayub not to have excessive dependence on United States.

Giving a graphic picture of the Indo-Pakistan war of 1965 which led to Bhutto's exist from Ayub's Cabinet and finally culminated in the downfall of Ayub regime, Mody feels that to the extent Bhutto might have contributed to this atmosphere, it was "a measure of his immaturity". But however, he adds that by 1971, he (Bhutto) "had acquired a more balanced outlook and had better understanding of Pakistan's fighting capacity" (p. 89). The author again feels that during the anti-Ayub agitation, Bhutto criticised Ayub, disagreed with him completely and ended by saying he did not think the language of weapons would work at all ; rather the weapon of language perhaps stood better chance (p. 95). Mukherjee derives three interesting conclusions from the 1965 war. First, the propaganda build-up during the months preceding the conflict had led the west wing to expect a walk over. When this did not happen, questions began to be asked why Pakistan had not fared better (p. 50). Secondly, the war widened the gulf between the two wings and finally the war intensified economic difficulties, partly because of the suspension of aid by the USA and partly because of the shortfalls in agriculture in 1965-66 and 1966-67 (p. 51). Bhutto, as the author subscribes, exploited these situations to his own advantage.

In their description of the country-wide general election in Pakistan during 1970 and it's follow up, the two authors give sharply different explanations. Mody justifies Bhutto's role as a defender of the integrity of Pakistan and criticizes Mujib's vacilating role at the negotiation table. On the other hand Mukherjee strongly feels that Bhutto was the main villain for the break up of Pakistan. The truth perhaps lies somewhere in between. Bhutto, launching his Pakistan People's Party at Lahore on 21 September 1968 very soon acquired a massive popularity in the western wing. His party's election manifesto issued in 1970 aimed at the attainment of a classless society but without violating the major principles of Islam. Mody however, cautions Bhutto for any blind imitation of an alien dogma. The author hails him as "the strongest advocate of economic justice and fairplay between the two wings of Pakistan" but never at the cost of disintegration (p. 121). In defence of his friend after the emergence of Bangladesh, Mody writes, "If Zulfi's judgement erred, he is guilty

of having made a political mistake—but cannot be accused of having acted in his own selfish interest" (p. 122). Mukherjee in his attempt to justify Bhutto's frantic bid to capture power during the civil war in Pakistan quotes Bhutto as saying that there were only two forces of any consequence in Pakistan—the military and the PPP and they should get together, although he was earlier talking of a third force i.e. the Awami League (p. 143).

Since Bhutto assumed power as President of Pakistan, he has claimed to have made substantive economic reforms on the basis of the slogan of his party i.e. "Socialism is our economy". Mukherjee with the insight of an economist analyses all the measures taken so far viz. lowering the land ceilings from 500 to 150 irrigated acres and from 1000 to 300 non-irrigated acres, taking over the management of some basic industries but leaving the ownership untouched, seizing the passports of the 22 richest families of Pakistan and asking them to bring back funds taken out of the country, the new labour policy which offered to raise worker's share in the annual profits of the undertakings from 2% fixed in Ayub Khan era to 4% and devaluation of Pakistan currency to speed up export earnings etc. Although all these measures have not resulted in a substantial economic growth in new Pakistan, the author is however quite optimistic for a better future because of the concentration of industrial growth in the former western wing.

Mukherjee wrote his book before the Simla Summit. But Mody having the privilege to come in close contact with Bhutto at Simla during the entire period, gives an optimistic note on the future pattern of relations between India and Pakistan. It will be relevant here to express Bhutto's feelings at Simla in Mody's words i.e., "With Pakistan battered to a standstill, with 90,000 prisoners of war in Indian hands, with the east wing broken away, with the west wing rent by defeatism and despair, Bhutto realised that the time had come to forget the past and to work towards a future where the subcontinent would be free from war and the threat of war" (p. 142). He is quite optimistic that Bhutto, as a consummate politician with a capacity to handle his opponents, is not in a real danger of being pushed out of power. According to him (Mody) nobody else has "the political stature, the popular appeal or the ability to replace him (Bhutto) (p. 162)." But history alone will decide as to how far this prophecy comes true. At the moment, no doubt he is the only foreseeable leader to govern a 'truncated and moth-eaten' Pakistan.

BOOK REVIEWS

ALEXANDER OF TUNIS : AS MILITARY COMMANDER

by W.G.F. Jackson

(Published by B.T. Batsford, London, 1971) Pp. 344, Price £3.60

FIELD MARSHAL HAROLD ALEXANDER has been acclaimed as one of the ablest field commanders of the Second World War. As such he is assured of his place amongst the great military captains of history. In this biography, the author has lucidly brought out the makings of this most liable Field Marshal from his earliest days. Commissioned in 1911, he was blooded in Flanders in the First World War. Indeed, he must have had a charmed life to have remained fit after having gone through the mincing machines of Mons, Marne, Ypres, Somme, Passchandale, and Cambrai. At Somme, in a few hours Britain lost 61,000 lives. At Ypres the loss was even heavier and very many battalions had less than a hundred persons when the evening muster parade was taken. 2 Irish Battalion, in which Capt Alexander was, lost 350 persons, in 48 hours of battle. Such was the ferocity of killing. Therefore, it is no wonder that Alexander having gone through such human sufferings knew to a fine art as to what a unit could take in war.

Alexander's road to glory started with his command of the residual British Expeditionary Forces at Dunkirk. Great Britain was keyed to receive disastrous tidings from across the Channel. But, in the bridgehead stood Alexander with admirable steadfastness, coolness and sense of purpose. He brought back more troops that could be hoped for. This brought him to limelight and gave openings for higher field commands. In Burma, the battle was lost even before he reached there. His performance was appreciated, but was not outstanding. Perhaps, because of the troops emotional and physical tiredness, and inadequate training and unfavourable air situation, nothing better could have been done.

It was in the Middle East that the star of Alexander shone brightly for the first time. True, he did not receive as much publicity as his equally eminent subordinate, Montgomery received. But, then the British were hard put to find a colourful rival to Rommel ; the twice defeated and self effecting Alexander would not fit for that purpose. Fortunately, the flambuoyant Montgomery was cut just for that role ! In the Alamein Battle, Alexander held a watching brief. But the Tunisian Campaign which ensued, gave him ample opportunity to display his strategic and tactical skill. Above all he was a master of the set piece battle and the employment of reserves. But, the most liked ability of his was the capacity to run an international team of soldiers. This quality finally made him C-in-C in Italy. The scope of his Italian Campaigns was curtailed when Italy became a secondary theatre. However, he successfully drew large Axis reserves from Western Europe, and what is more, defeated them piecemeal. He displayed much acumen in the handling of reserves, and in the understanding of the limits of human endurance.

What is Alexander's place in military history ? He was loyal, astute, fearless, and self confident. He had always the pulse of his vast command, and never demanded of it what they were not capable of. In these respects he was second to none. But it is doubtful if he really looked far beyond military aims and saw the post war world as Eisenhower did. His sense of loyalty was too intense and direct to serve diverse political aims. I feel that he will be remembered as a model professional officer and gentleman worth emulating. He was no second Marlborough.

General Jackson has done a valuable service in bringing out this book. It is highly readable and well supplied with illustrations and charts. I wish he had brought out in greater detail the mud and blood of Flanders fields. It was here that young Alexander learned the limits of human endurance, and that it was the last straw at Verdun, which brought about the French mutiny. He never forgot this experience in his long and distinguished career. This is a very useful book, particularly for regimental officers as a prelude for detailed study of the two World Wars.

—TNRN

CAPTAIN COOK

by Alistair Maclean

(Published by Collins, London, 1972) Pp. 191, Price £ 2.25

ALISTAIR MACLEAN has written many best-sellers, such as 'The Guns of Navarone', 'Ice Station Zebra', 'Bear Island', and many others. Many of them have been made into immensely successful films. Mr. Maclean, in this book, has presented a graphic account of Captain James Cook, who became at the time of his death in 1779, the greatest combination of seaman, explorer, navigator and cartographer that the world had ever known. The author has described in exciting detail his three amazing voyages and the adventures that befell him, his crews and his ships in lands that until he sailed were in many cases unknown. Cook's life was a resounding success and the story of it is a thrilling exemplification of his own description of himself as a man 'who had ambition not only to go further than anyone had done before, but as far as it was possible for man to go'.

Cook had driven himself mercilessly, and his men likewise, yet the surgeon's mate on the 'Resolution', was able to write ; "In every situation he stood unrivalled and alone : on him all eyes were turned ; he was our leading star, which at its setting left us involved in darkness and despair."

The book highlights the accounts of Captain Cook's voyages between 1768 and 1789. During this period Cook circumnavigated the globe three times in voyages of discovery that broke record after record of exploration, endurance and personal achievement. He explored and chartered the coasts of New Zealand, landed in Botany Bay, explored the Pacific, mapped its Islands, and travelled further south than any man before him ; he explored the Great Barrier Reef and travelled thousands of miles north to

tackle the North-West Passage. He excelled in all aspects of his craft and inspired in his own men an affection for him and an enthusiasm for his undertaking that provoked constant loyalty and unfailing endeavour in frequently savage conditions.

The Biography is incomplete. There are many details missing. The details of his family life, his wife and children are not there. The account of his voyages in the book is perhaps just enough to let us have an inkling of the essential Captain Cook for he was a man, as he himself confessed, to whom achievement meant all.

—A. K.

MAN OF WAR

by Richard Ollard

(Published by Hodder and Stroughton, London, 1969) Pp 240, Price 50s

"MAN of War" by Richard Ollard. This book deals with the life and achievements of one of the lesser known Restoration Navy officers of the British Royal Navy. Sir Robert Holmes appears for the first time as a Cornet of Horse in the Armies of the Stuarts before the advent of Oliver Cromwell. He followed his Masters into exile and during this period converted himself into a professional Naval Officer of a very high order and calibre. Naturally not being a very well known person, he disappears for a period during the exile of the Stuarts, and reappears with the restoration of Charles II. He successfully led Naval expeditions to the Gambia and the Gold Coast which established a high reputation for his leadership, courage and skill. This was the period when Pepys, the great Naval Administrator in British History was hard on work in the British Admiralty organising and laying down the foundations for a modern full time Navy. For 30 years Holmes and Pepys intrigued and manoeuvred and quarrelled over naval matters, but since the more famous and better known is Pepys, little has been written or known about Sir Robert Holmes, who can in all fairness be described as the first professional Naval Officer. The author Richard Ollard who for several years taught history at the Royal Naval College, Greenwich, has made this book into a very interesting, readable and highly informative, well documented story. It fills the gap in an important part of British Naval History. Many know the names of Blake and Nelson but relatively few have heard of Sir Robert Holmes, their ancestor, who laid down and put into operation many of the conventions and practices of his profession. A very readable book recommended for Naval Libraries.

—KAY

MAO PAPERS—ANTHOLOGY AND BIBLIOGRAPHY

ed by Jerome Ch'en

(Published by Oxford University Press, London, 1970) Pp 221, Price £ 2.75

MR. Ch'en has put in real hard labour to wade through vast collection of Mr. Mao Tse-tung's letters, speeches, lectures, expositions, Instructions and writings gathered from different sources, some so little known. To sift and verify those as of Mao's origin, must have taxed his wits considerably. The devotion with which he has compiled this book and the detailed Bibliography, is something commendable.

In translating Mao's writings into English, Mr. Ch'en has made every endeavour to preserve the original flavour. He has arranged and organised the material in chronological order and in proper sequence. This considerably helps the understanding of the events in China, which happened from time to time. His essay on Mao Tse-tung's literary style is illuminating.

The facility with which Mr. Mao expresses his sentiments through classical parallels, shows that he had adequate training in Chinese classics, which left a deep imprint on Mao's thinking and conditioned his literary style.

Mr. Mao Tse-tung as revealed through the pages of this book, is a down to earth practical man, having pragmatic views on every facet of life though studded with fads here and there. His interest in literature is evident from his poems and writings, which incorporate 3 ingredients viz.. europeanization, the classical heritage and colloquialism, the second being more predominant. His style though admirably clear, was unfashionable. Generally speaking, to begin with it was formal, stiff and tentative, but with the passage of time, his sentences became shorter, crisper, allusions less and classical structures infrequent. Writing on Military subjects, his style is free and lucid. From 1966-69, Mao chose to use terse and peremptory (dogmatical) form of communication for the Cultural Revolution with a purpose, than the long expositions that he was accustomed to.

Mao, as he emerges, is a man from and for the masses. He has expressed his views, practically on every subject under the sun. He is quite clear and emphatic about what he says. He wants all that to be carried out and a veiled threat to that effect is quite discernable. He is fantastically clear about every thing he says, e.g.,

> "...some comrades are afraid of the masses, their criticism and what they say ... what is there to be afraid of?"
>
> "...it is true that under our system, counter revolutionaries have no freedom of speech...."
>
> "...must adopt an attitude of genuine equality... must not assume airs... if criticism is correct, we must accept it and reform ourselves....."
>
> "Chinese economy is backward and China is economically weak..."
>
> "In the past we had talents in fighting and land reforms...now we must learn...understanding of bussiness matters, Science and technology".
>
> How clearly he spells out his method when he says,
>
> "Attack one or few points, exaggerate them and ignore the rest...."

The Ministry of Education, University Grant Commission and the Universities in India could take a cue about the Examination and Education System, from Mr. Mao's revolutionary views on the subject when he says:

"The present examination system is more suited for enemies than for the people.....My suggestion is to publish the questions first, let the students study them and answer them with the help of their books.....the present system strangles talents, destroys young people.....It is murderous and must be stopped."

The book makes an interesting, though a bit patchy reading at places. From it emerges a clear picture of Mao Tse-tung. After going through it, one feels, that one knows and understands the mastermind of China better.

Mr. Jerome Ch'en has done a yoeman's job in editing such a mass of material for this book and succeeded in giving it such a presentable shape and form.

The Oxford University Press deserves cudos for the excellent printing free of misprints, which so much plagues printing in India.

—MS

CONTEMPORARY MILITARY STRATEGY

by Morton H. Halperin

(Published by Faber and Faber, London, 1972) Pp 149, £ 1.95

A BOOK of as much interest to the casual civilian reader as to a dedicated student of defence studies. It is written in straight forward language and whilst avoiding much rhetoric of the Pentagon type, it gives the reader a general broad picture of the considerations which have affected the major military thinking of the U.S. since 1945. It also attempts to peep at the military thinking on the defence problems of the USSR and China. The book may be described as a defence oriented study of the foreign policies of these three powers interacting on each other, under the limiting umbrella of total nuclear warfare, of which all three are apparently equally apprehensive. The bulk of the book deals with the strategies that have been followed in western Europe in the past, or likely in the future, whilst a minor portion of the book has been devoted to the problems peculiar to Asian countries and the varying extent to which they affect the two super powers. Whilst discussing the pros and cons of the nuclear arsenal and weaponary, it is interesting to observe that conventional armies and weapons are still retained by all concerned in appreciable numbers and quantity. The author Mortor H. Halperin who has written this very interesting book, has worked for the American Defence organisation, and is to be complimented for having produced a very interesting and easily readable book. The theme that war has become outmoded because of the advent of thermo-nuclear weapons and inter-continental ballistic missiles is effectively exploded in this book as it makes clear that whilst the danger of a thermo-nuclear war, is relatively remote, limited conventional and unconventional military operations are always possible and of these we have known many—Korea, Congo, Vietnam, etc.

A book strongly recommended for the serious student of military affairs and service libraries.

—KAY

THE ART OF WINNING WARS

by James Mrazek

(Published by Rupa & Co,, Calcutta, 1972) Pp. 218, Price Rs. 40.00

THE author has spun out two theories in the 160 pages of the book, viz., one, that good generalship consists chiefly in initiative and creativity, and, two, that a book of war can be dispensed with. About the truth of the first there is, and can be, no doubt whatsoever, provided it is broadbased on other ingredients of warfare, like organisation training, equipment, etc. This truth is universally acknowledged. The second is, however, highly questionable, for a book of war can be improved upon but can hardly be ignored, except at grave peril.

It is difficult to stomach the assertion made by the author that the "most significant military victories have been artistic masterpieces, owing more to insight than infantry". Mere comprehension of a given situation is one matter. It is quite another to give practical effect to a brilliant plan of operation. Mere insight cannot wholly substitute "infantry" by which the writer probably means the military organism. Superior organisation and sophisticated weapons are the fundamental pre-requisites of victory in war. It is only when these conditions are satisfied that insight and intuition make their impact. Napoleon, according to one historian, fought more battles than Alexander, Hannibal and Caesar combined. His theories were based upon some established principles, and military writers have discerned certain broad patterns of strategic concepts and methods in his numerous campaigns and battles. For the first time since gunpowder had appeared on the battlefield, Napoleon brought about a congruence among weapons, tactics and doctrine. His innovation consisted in assimilating the weapons of the age of gunpowder into consistent patterns of military theory and practice. It is true that he did not commit his concepts to paper. But this methods of warfare and the concepts underlying them are deducible from the record of his achievements.

He developed the potentialities of the divisional system and used it in mobile warfare and tactics of fast manoeuvre. He introduced permanent army corps in the French army. He was also a master of planned and improvised supply. He perfected his cavalry and infantry in rapid marching and skilful deception. So much to refute the idea that victories result more from "insight than infantry".

The title of the book is so catchy that one hoped to find in it an analysis of the factors that make for victory in modern war. More so, as the book is written by a soldier of 37 years of experience. However, one vainly looks in it for new lessons, such as those which the Arab-Israeli war of 1967 and the Indo-China war have thrown up.

—KMLS

NUCLEAR POLITICS : THE BRITISH EXPERIENCE WITH AN INDEPENDENT STRATEGIC FORCE 1939-1970

by Andrew J. Pierre

(Published by Oxford University Press, New York, 1972) Pp 378 Price £5.50

THE author had painted on a broad canvas with a flat brush the origin and growth of nuclear arms and politics ; Great Britain's experiences form the motif and they stand out in vivid colours. The high-ways and bridal paths leading to the future disappear into thick mist, either on purpose or accidentally. In 1941, Britain conceived the nuclear bomb as a military necessity and commenced pioneer work to forestall Germany. Due to its high cost and other wartime difficulties, the development work was shifted to the USA. As a result, the two billion dollar Manhatten Project came into being and the Hiroshima bomb was produced. This was an eye opener for the politicians and soldiers, and for the first time they realised that nuclear weapons were in reality powerful political instruments. The first bomb also triggered off a fast nuclear race between the two Super Powers, with Britain as a poor third. By this time Kipling's Britain was gone, and the residual Britain was actively groping to crystalise herself interests and world wide responsibilities. She knew that she was no longer a Super Power, but refused to concede that she had no greater world wide interests than other European powers. The Super Powers produced in succession the Hydrogen Bomb, Sputnik, ICBM, MIRV, and ABM.

Thus, the British rationale to produce an independent nuclear deterrent was her anxiety to retain political and military flexibility in international matters. For this she had to pay dearly, and frequently carry out reappraisals if the political and economic costs justified the venture. By 1952 she had a nuclear bomb, but the delivery source—the 'V Bombers'—became operational only by 1961. Very quickly these bombers were outclassed and Britain pinned her faith on Blue Streak intermediate range missiles. This missile was soon given up, after spending some 65 million pounds, as technology considerably changed. The British efforts to obtain Sky Bolt from the US had similar fate. Finally, thanks to the intervention of Eisenhower, Britain ended up with the Polaris submarines. During the interegnum, efforts were made on both sides of the Atlantic with proposals like 'Multilateral' and 'Atlantic' Nuclear Forces, to accommodate Britain and other European countries and to disuade them from running the nuclear race. Probably, by 1974 the Polaris submarines would have passed their optimum efficiency, and Britain has nothing to replace them. An agonising decision soon she has to take is, whether she should continue to have an independent nuclear deterrent, in the changed circumstances. Now she is part of NATO, as well as a member of EEC. Her overseas commitments are largely confined to commercial interests. The tension in Europe is much less. The US has made up with China and the USSR, and the Helsenki Conference has held out hopes.

According to the author, politics is the corner stone of the decision of a nation whether it should go nuclear. Then comes economics and technology. During the years of the development of the Bomb, UK was spending almost eight per cent of GNP on defence. She could not maintain expenditure at that level and under the labour Government it was

brought down to about five per cent. Thus the conventional forces came to be cut by about three hundred thousand. The concepts of massive retaliation, and even graded response, are no longer fully valid. Even with the backing of tactical nuclear weapons, Norstdt wanted thirty conventional divisions as a minimum force for NATO. Inspite of their 'special relations', in the matter of nuclear weapons, the US has consistently followed a hard line towards Britain. The McMahon Act, watering down of Quebec Agreement, the positioning of US IRBMs in Britain, the concept of multilateral force and the turning down of the Atlantic Nuclear Force are a few examples of this attitude. The European constituents of NATO have to decide if the US nuclear armaments would be used with enlightened self-interest, and whether that self interest is as stable as they would like it to be. The future of Britain's nuclear armaments as well as Anglo-French-German collaboration would depend on this answer.

For other countries, Britain's experience is a revelation. Do they want to follow China's example and willy nilly possess some nuclear capability for political and ideological purposes ? Will Israel, who has the capacity to make atom bomb, depend on the bomb to obtain a long-term solution for her problems ? Will Japan remain satisfied with US assurances, or will she turn towards USSR also, or will she make her own deterrent? These are some of the questions the reader may address himself. Considerable research has gone into the writing of the book. For clarity sake, the author has repeated various facts in different contexts. I would classify this as a very useful reference book, though I have no hesitation to recommend it for general reading.

—TNRN

THE INDIAN OCEAN

by Devendra Kaushik

(Published by Vikas, Delhi, 1972) Pp 225, Price Rs. 24.00

THE Vietnam War, seemingly in its last violent gasps and the cold war in Europe long dead and non-existent since the powers have decided to co-exist peacefully there, the scene for the Super Power struggle shifts to the Indian Ocean.

Many books have already been written about the struggle for naval supremacy in this vast expanse of water. The Soviet Union has today the largest and probably the most powerful navy in the world. Most of these books have dealt with the Indian Ocean in the context of a naval threat from the Red Navy to the developing and under developed countries that surround the Indian Ocean.

In Dec, '71, however, the falacy of this context was proved when the United States Seventh Fleet moved into the Indian Ocean from the Gulf of Tonkin in what was obviously an attempt to give some sort of support to its Cento ally Pakistan during the hostilities. Recently, US naval authorities have been making overtures to certain countries in the ocean area like Ceylon for docking facilities.

Devendra Kaushik is an expert on Soviet Affairs having studied in Moscow for four years. Inspite of his education and specialisation in Russia, he has been able to discuss this international question much more rationally than other authors who have been educated by the West.

The book first traces the history of power in the Indian Ocean until the end of the second World War. Mr. Kaushik then discusses in detail the socalled British East of Suez Policy and the anglo-american aim of dominating the area by building up naval power of an aparthied South Africa on the West flank and Australia in the East. He introduces the two new powers entering the scene—a super technological Japan, and a Terrifically powerful China.

The chapter on the Persian Gulf makes interesting reading. This is an area where there is a constant struggle for power, a struggle for control on the "black gold"—oil. For, control of the Indian Ocean will mean control over the oil interests of the gulf. Here all the major powers are busy playing games of jugglery with the numerous rich sheikdoms. Of late some of these sheikdoms have got fed up of playing as pawns in the big powers game. The formation of the Federation of Trucial States is a promising step to make this an area of peace.

Most of the book was written in '71 before the outbreak of the Indo-Pak war. In a short postscript, Mr. Kaushik discusses the implications of the Gunboat Diplomacy exercised by the United States in moving the Seventh Fleet into the Bay. Here he rightly stresses the need to declare the Indian Ocean as an area of peace.

—MR

THE THIRD ARAB ISRAELI WAR

by Edgar O'Ballance

(Published by Faber and Faber, London, 1972) Pp. 288, Price £ 3.50

THE Third Arab-Israeli War of 1967 and its outcome did not cause much surprise to knowledgeable political and military observers; nevertheless its course of events was revealing. The author has very ably traced the whole history from the very beginning. Israel had the support of the USA, France, West Germany and other countries, while UAR and the other Arab countries were aided by the USSR. After the Six Days War of 1956, both the parties had completely restructured their defence forces and re-equipped themselves with modern weapons and equipments.

Serious notice is taken of the philosophy of war adopted by Israel. She had an abiding faith that the next war would last only for a few days. Another crucial appreciation she had gambled upon and won was that the Arab countries would not take the initiative to launch the attack, for political reasons. On these premises, she reorganised her forces into brigade forces, drastically cutting on administrative support. The result was to put everything available at the shopwindow for immediate use. Her strategy was to deliver an overwhelmingly strong surprise air attack (of the

Pearl Harbour type), with the aim of crippling the enemies air force, early warning devices and air defence sites, within a few hours. In fact, she achieved this, due to the dedication of her pilots, and even more so of the ground staff, who serviced and sent back the planes to do an unbelievable number of sorties. Thus, the ground battle was practically decided on the very first day itself. The long and slender shape of the country, and also the absence of natural defences precluded Israel from developing any defence strategy. In fact what she adopted was the Napoleonic dictum 'fire is everything' and superimposed on it the shock value of mechanised cavalry. A contributory factor of Israel's success was her superior intelligence.

The Arab countries, particularly the UAR, were inhibited by rigid political control. In spite of all their talk, they had not evolved and properly coordinated plans. The mobilisation of men and material was not thorough enough. There were many anomalies and imperfections in the defence organisations. They looked elegant enough, but failed under the stress of war. There was too much of centralisation and too little of trust and confidence. The latter qualities have to be strenuously cultivated during peace-time training to give dividends in war. Luck was against the UAR, in that her C-in-C was caught in an aircraft when the war started. It is surprising that there was no second person immediately available to take matters in hand, and give directions. Inefficient inter-communications also played a dominant part in the defeat of the Arab countries. But, perhaps their most serious tactical mistake was not to have correctly appreciated the scope of desert warfare. This, in spite of all the experience of the North African Campaigns at the doorsteps of Egypt!

The author has concluded the book on a pessimistic note—fully realising the added importance this region is acquiring, in an energy starved world. Contained in the book is also the information that Israel has a nuclear generator and that she may be making a few atom bombs. Left to themselves the countries of the region could be expected to take note of such foreboding possibilities and evolve some workable solutions. But, so far there are no such trends. As the Duchess said in the Alice in Wonderland "if everybody minded their own business, the world would go round a deal faster than it does".

—TNRN

THE FRONTIER 1839-1947: THE STORY OF NORTH-WEST FRONTIER OF INDIA

by J.G. Elliott

(Published by Cassell, London, 1968) Pp 306, Price 50s.

THE author served for more than 30 years in the old Indian Army and had spent about a third of that time on the Frontier i.e. the old North West Frontier of India and the present North-West Frontier of Pakistan. He is, therefore, well qualified to write a book tracing over a hundred years of history of that Frontier.

He has gratefully acknowledged the various Officers who have helped him particularly Field Marshal Auchinleck and Sir Olaf Caroe. Incidentally, it is of interest that among the others to whom the author is indebted is Major General I.C. Katoch at present Commandant of the IMA and earlier Army Adviser to the High Commissioner for India in U.K.

There were three parties which went to the making of the events concerned with this history—the Pathans, fierce but independent native inhabitants, the Indian Army whose skill and gallantry on occasions surprised even their admirers and the politicals, often well meaning who were misguided by interference from London but who at times were certainly not the best men for the job. The author skillfully and interestingly traces the history from 1839, the year of commencement of the First Afghan War to 1947, the year of partition of the subcontinent of India and the consequent formation of independent India and Pakistan. He brings back nostalgic memories to those who have served on that Frontier. Who among those do not remember the RODS (the road open days)? But, do they all know that the first lesson of mountain warfare viz. to move strong detachments along the crests on either flank to enable free movement of the main force was learnt during the First Afghan War 1839-42?

Again the Indian Army was not built overnight. Service on the frontier gave those stationed there training for active service and a common sense of purpose. "No officer with a spark of fire or ambition was content to serve out his days in single battalion stations in the enervating climate of the Madras Presidency. Only the dead wood remained there with disastrous effects on the morale and efficiency of their men". Had it not been for Lord Kitchener who started the rotation system of service on the frontier for all, the calibre of our army would certainly have not been high.

As a sequel the author visited Pakistan in 1966 where he felt that the resemblance to what the Frontier was twenty years back was uncanny. Any officer could return today and easily pick up the threads just as if he had been on leave. The final compliment by the Pathan Superintendent of Police who was his host saying that it had been "a very great pleasure to have the chance of talking to an English General" is touching but the reader can decide whether it was said merely to please or was genuine.

—J.A.F.D.

WHEN A GREAT TRADITION MODERNIZES

by Milton Singer

(Published by Pall Mall, London, 1972) Pp 430, Price £5.00

THIS new anthropological path breaking work by Milton Singer would pass Ruskin's tests for 'books of all times'. The illuminative title subtly and succinctly summarises what the reader would find in this succulent master piece. Comprehensive study of civilization, as opposed to those of societies and cultures, by anthropological discipline is a comparatively fresh and daring approach. A general reader may feel shy to

open the volume, on account of its imposing title and size. But he will indeed have a rewarding experience if he would take the plunge and sail in the waters so well chartered by the author.

Indian civilization, like other noble ones, is a conglomeration of diverse cultures, technologies, religions and humanities. It defies easy definition. There is an erroneous suspicion amongst many Indians and foreigners, that our tradition is spiritual and static and is incongruous for modernization. Even anthropological authorities like Max Weber shared this conclusion. Later evidence has shown that such views are largely due to not paying sufficient importance to Socio-historical factors. It paid British interests to paint India as an abode of unchangeable spirituality, and the Indians as a people devoid of ambitions for progress. The geographical factors were over emphasised. Social and cultural changes become viable only in an unfettered society, as they are the final products of many interactions ; all beginnings have to take place in the minds of men, and then transcribed into 'Little Traditions'. Only the fit ones amongst them will gain the status of 'Great Traditions', and that only after an era of trials and discards.

Unlike many other religions, Hinduism has no supreme spiritual head to lay down the law. The fountain head may be considered as the scriptures. But, it is their interpretations that actually matter. The leads given by God-heads and Masters at various periods differ, and a careful observer would find a lot of practical acumen in their methods. Stress has been at various periods is on 'jnana', 'karma', and 'bhakti'. Lately, population growth, mass media of communication, land reforms, and free elections have brought about considerable changes amongst all Indians. Though seventy per cent Indians still live in rural areas, there is definite shift of population to urban areas, particularly of the younger generation. The time consuming and rural oriented rituals and ceremonies cannot be conveniently conducted in the changing atmosphere. Consequently, the 'bhakti' movement has lately gained much ascendency. Its genius is that it is capable of accommodating even the ever accelerating tempo of modern living. With a minimal observance of rituals, the solace of spirituality and the benefits of karma' are brought to the individual, either by a Guru, through community bhajans. Similar practical changes are visible in many facets of Indian life. Art and dances have been updated, but 'Bharatnatyam' and others retain their religious and cultural motifs. Birth, marriage and death ceremonies have been simplified. Ayurveda has incorporated many ideas from the Western medicines. The hierarchial agricultural joint family has given way to smaller family units, many of which function within the folds of a federation.

India's 'Great' and 'Little Traditions' have never blocked the paths of real progress. Even cast has under-gone radical changes, and in a generation or two will be indistinguishable. The vitality of our civilization is manifest in its ability to interact with progress, and even while constantly changing retaining the core. Fundamental values like Brahman, Truth and so on have withstood the erosion of time. It remains to be seen if super industrialisation will alter this equation. There is evidence in the United States that many permanent values have fallen and 'transcience' is gaining acceptance. A modular man appears to be emerging. Time alone can reveal how the ever changing Sanstritic India will fare under super industrialisation.

Milton Singer has carried out considerable field study in addition to theoretical study for this work. But, he will be the first to agree that much more work is required in this direction, before a more generalised theory could be expounded. The book is of practical value to all who have the task of evaluating 'raw materials'. For an anthropologist or socio-cultural historian, it is a very handy reference book. Its appearance is at the right time, as we are facing great changes in the corridor of time.

—TNRN.

SECRETARY'S NOTES

MEMBERS' ADDRESSES

Letters sent to members are sometimes returned undelivered by the Post Office with remarks such as 'the addressee has been transferred', etc. This appears to be on the increase and the only way to rectify it is for members to drop a line to the secretary whenever their addresses change due to promotion, transfer, etc. It is of the utmost importance that the Institution should have the up-to-date addresses of all its members, for the desptach of quarterly journal.

ANNUAL SUBSCRIPTION

Although the Institution's year 1973 is now six months old, I regret to say that there are still many members who have not yet paid their subscription which was due on the 1st January last. Could I therefore request all members who have not yet paid their subscription for the current year, to let me have their remittance by return of post.

LOAN OF LIBRARY BOOKS

Members are requested not to pass on the books which they have borrowed from the Library to their friends. This delays return of books to the Library and causes unnecessary inconvenience to other members, on the waiting list.

NEW MEMBERS

From 1st July 1973 to 30th September 1973, the following members joined the Institution :—

AGARWAL, Captain, G.N.
ALLAHABADI, Captain TEJ
ARORA, Sqn. Ldr. S.L.
ATAL, Lt. B.S.
AVLASH, Flt. Lt. K.
BAHL, Captain R. (Life)
BAJWA, Major G.S.
BASWANI, Major S.P.S.
BAL, Major J.S.
BALWANT SINGH, Major
BASRA, Sqn. Ldr. D.S.
BHARATHAN, Major K.
BHATIA, Sqn. Ldr. K.
BHATT, Flt. Lt. J.N.P.
BHATTACHARJEE, Captain A.R.
BHONSLE, Sqn. Ldr. S.S.
BRIJ RAJ SINGH, Captain
CHAKRAVERTY, Major S.K.
CHANDOK, Major J.S.
CHENGAPA, A/Major K.C.

CHAVAN, Major D.K.
CHOWDHARY SUSHIL KUMAR, Major
DHULL, Major H.S.
DIGHE, Sqn. Ldr. S.D.
GAJRAJ SINGH, Major
GANAPATHI, Sqn. Ldr. K.S.R.
GEORGE, Captain K.C.
GOVIND, Major, S.G.
GREWAL, Captain S.S.
GULARIA, Major R.P.S.
GULATI, Major B.R.
GUPTA, Captain R.K.
GUPTA, Major Y.R.
GYANI, Major H.S.
HARBHAJAN SINGH, Major
HARINDER SINGH, Major
HARSHPATI, Lt Col.
HUNDAL, Major H.S.
JADHAV, Major V.B.
JAGNIT SINGH, Captain
JAI KRIPAL SINGH, Major
JASWANT SINGH, Captain
JERATH, Major V.P.
JETLY, Major R.C.
KANYAL, Major S.S.
KAPIL DUTT, Captain
KELKAR, Flt. Lt. A.D.
KHANNA, Major RAMESH
KHANNA, Captain V.K.
KHULLAR, Major D.K.
KOHLI, Major AVINASH
KONDAIAH, Sqn. Ldr. R.
KUMAR, Major S.C.
KUNCHERIA, Captain K.K.
KUPPA, Captain V.S.
MADAN, Major, D.S.
MADAN, Captain V.
MAHENDRU, Major M.S.
MALHOTRA, Major C.M.
MALHOTRA, Major, J.L.
MAMGAIN, Sqn, Ldr. S.C.
MEHRISH, Major S.L.
MEHTA, Major KEWAL KRISHNAN
MEHTA, Major Y.S.
MISRA, Major SARAN KUMAR
MITHARI, Captain PRAKASH
MUTALIK, Flt. Lt. S.G.
NAGAR, Captain K.R.
NAIR, Major K.S.
VINOD NAKRA, Captain
NARANJAN SINGH Major
PARAKASH, Flt. Lt. OM
PACHOR, Major V.C.
PARIHAR, Captain R.S.
PATHANIA, Major R.S.
PHATAK, Major A.P.
PITAMBER LAL, Major
POONIA, Major BALBIR SINGH
PRABHAKAR, Fg. Offr. P.
PRAKASH, Major O.M.
PRAKASH SINGH, Captain
PURI, Sqn. Ldr. C.P.
RAGHU RAM, Sqn. Ldr. R.
RAJENDER SINGH, Captain
RAMA MOORTHY, Sqn. Ldr.
RANJIT SINGH, Major K.
RAO, Sqn. Ldr. V.T.
SAHNI, Major S.P.
SAHAEE, Captain N.S.
SANDHU, Major R.S.
SANGA, Captain M.S.
SANTHANAM, Major C.N.
SASHI KUMAR, Sqn. Ldr. S.G.
SEHGAL, Sqn. Ldr. R.S.
SETH, Flt. Lt. V.K.
SHARDA, Captain K.L.
SHARMA RAMESH CHANDER, Captain
SHARMA, Major S.R.
SINHA, Captain D.K.
SINHA, Captain K.K.
SINGH, Captain K.K.
SINGH, Major K.M.I.
SINGH, Captain T.D.
SINGHDEV, Lt. K.P.

SOIN, Major L.N.P.S.
SOOD, Major R.K.
SREERAMALU, Major V.
SRIVASTAVA, Major O.P.
SUBBA, Major K.K.
SUBBIAH, Major D.
SUNDARA RAJAN, Sqn. Ldr.
THAPA, Lt. Col. D.S., Pvc.
UDAYA CHANDER, Major Y.
UPPAL, Captain SURINDER
VERMA, Major VIJAY KUMAR
VARMA, Captain T.N.K.
VERMA, Major DIMKOR
VARTAK, Captain A.R.
VASHISHTHA, Major General K.D. (Life)
VIJ, Sqn. Ldr. S.K.
KUMAR, Major VIJAY
PRASAD, Major VIRENDRA
WADERA, Major M.M.

Eight officers messes and institutions were enrolled as subscribing members during this period.

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181.4	Reymond, Lizelle	To live within. 1972
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301.32	Barratt, John and Louis, Michael	International aspects of overpopulation. 1972
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320.158	Conquest, Robert	The Nation Killers. 1970
	INTERNATIONAL LAW	
341.18	Amme, Carl H.	Nato without France. 1967
	INTERNATIONAL RELATIONS	
327	Duchacek, Ivo D	Nations and Men. 1971
327	Trevelyan, Humphrey	Worlds apart : China 1953-5 : Soviet Union 1962-5. 1971
327.05	Allen, Richard V ed.	Yearbook on International communist affairs. 1968
327.155	Morris, Eric.	Blockade ; Berlin and the cold war. 1973
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	EAST ASIA	
950	Vinacke, Harold M.	A history of the Far East in modern Times. 1971

CHINA

951.05	Snow, Edgar.	The long Revolution. 1973
951.05	Suyin. Han	The Morning Deluge Mao-Tse-Tung and Chinese Revolution 1893-1953. 1972

TIBET

951.5	Peissel, Michel	Cavaliers of Kham : The Secret War in Tibet. 1972

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358.430597	Littauer, Raphael and Udhoff, Norman ed.	Air War in Indochina. 1972
959.7	Sharp, U.S.G.	Report on the War in Vietnam (As of 30 June 1968)

BANGLADESH

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AFGHANISTAN

958.1	Tate, G.P.	The Kingdom of Afghanistan. 1973

MILITARY SCIENCE

355	Rae, John	Conscience and Politics. 1970
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ESPIONAGE AND INTELLIGENCE

355.343	Delmer, Sefton	The Counterfeit spy. 1973
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355.343	Michel, Bar-Zohar	Spies in the promised land. 1972
355.3430942	Haswell, Jock.	British Military Intelligence. 1973

ADVENTURE AND TRAVELS

910.4	Hardwick, Michael	The World's greatest Air Mystries

FICTION

808.3	Cosmin, Tina	The Flight of Andrei Cosmin. 1972
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BIOGRAPHIES AND MEMOIRS

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923.254	India, Information and Broadcasting (Min of)	The collected works of Mahatma Gandhi. Vol. 49 and 50. 1972
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WORLD WAR II
(1939—45)

940.53	Simkins, Peter	Book of World War II (illustrated) 1972
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940.548	Astley, John Bright	The Inner Circle. 1971

INDIA

327.54047	Prasad, Bimal	Indo-Soviet Relations 1947-1972. 1973
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954.03	Dutt, K. Iswara	Congress Cyclopaedia : The Indian National Congress 1885-1920 Vol. 1
954.03	Edwards, Michael	Red Year : The Indian rebellion of 1857. 1973
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954.03	Van den Dungen, P.H.M.	The Punjab Tradition : Influence and Authority in Nineteenth Century India. 1972
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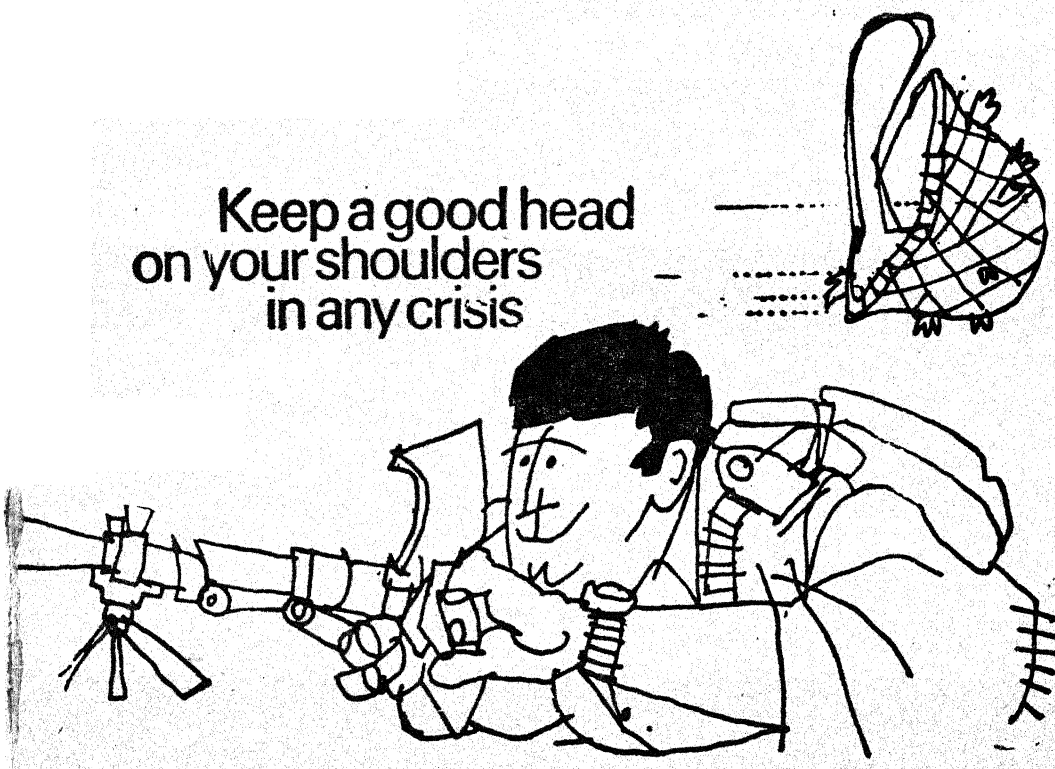

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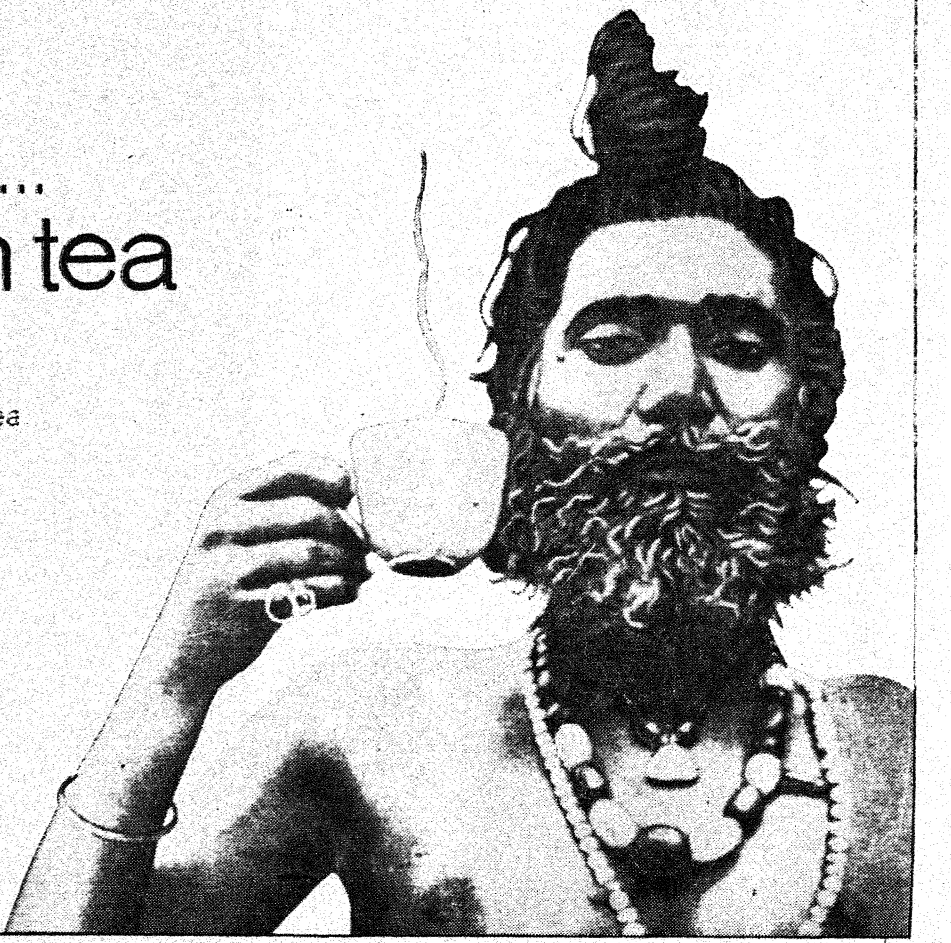

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